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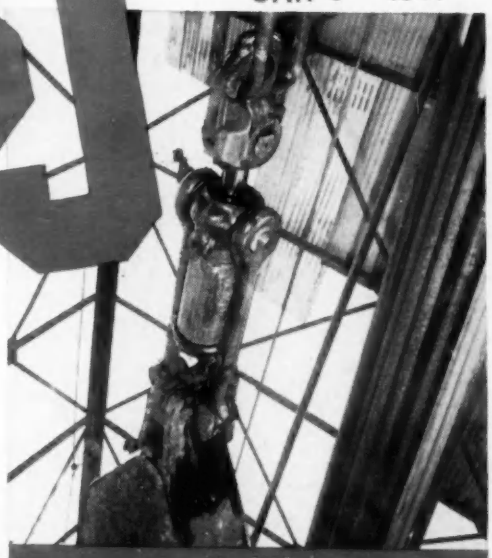
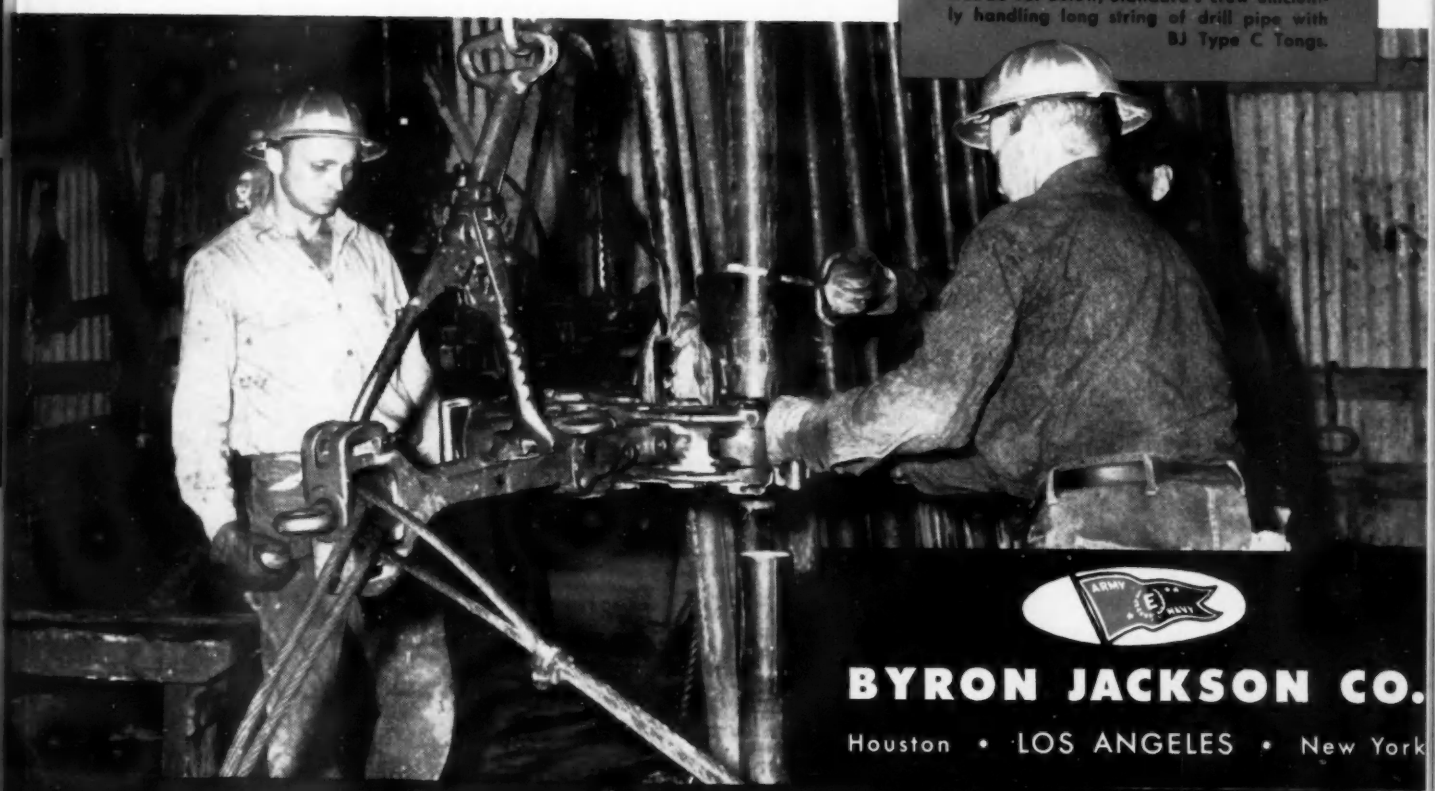


BJ 300-ton Hook in operation on Standard's KCL-20-13. Below, Standard's crew efficiently handling long string of drill pipe with BJ Type C Tongs.



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THE OIL WEEKLY

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LOOKING AHEAD
... with the Editor

WITHIN the confines of the Anadarko basin of Oklahoma and the Texas Panhandle, it is believed that vast, thick sand bodies are to be found which will carry tremendous quantities of oil under heavy pressure. Estimates of the amount of recoverable oil that may be found within this major synclinal feature range between five and ten billion barrels—more oil than Oklahoma has produced up to the present time.

A campaign to tap the potential reserves within this geological trap will apparently get under way during 1945. Exploration will involve the boring of deep and expensive test wells.

Only about one third of the basin lies within the borders of the state of Oklahoma. In its entirety, the basin covers approximately 140,000 square miles. Its geology is still comparatively unknown since surface rocks by their nature do not permit reliable surface mapping, and the shallower sediments in much of the region contain evaporites that have made geophysical interpretation difficult.

An extensive resume of production and prospecting within the area and a discussion of the major factors in the future development program will be presented in an early issue by Anthony Gibbon, staff writer, in the Mid-Continent territory. His presentation points to the area as one of important potentialities.

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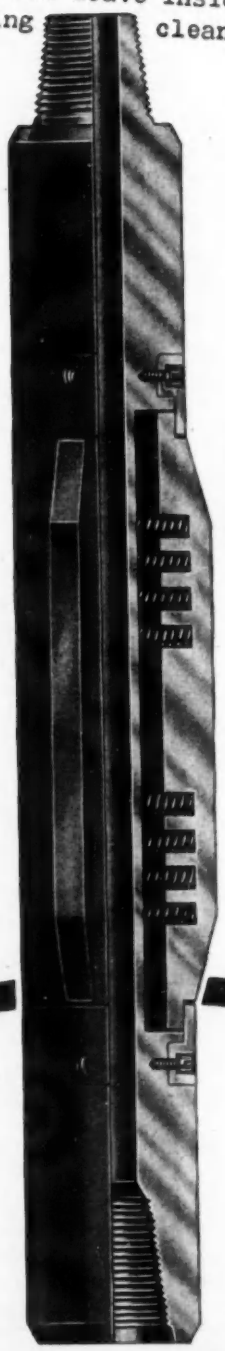

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The Changing Panorama

Drilling Goal High For District 3

IT NOW appears doubtful that District 3 will attain the 1945 drilling program outlined by PAW. To do so it will have to complete 11 percent more wells than the peak of 165 per week reached in the final quarter of this year. The PAW program for District 3 calls for 9800 wells for the six-state area, an average of 189 per week.

With the number of active drilling rigs in operation already at an all-time peak, much additional material will be required. The turn of events in Europe indicate the materials situation may be tighter than in early 1944.

More materials also will be required for maintenance and repair. Much of the present drilling equipment already has been in operation far beyond its normal period of service, and contractors say that failure of parts, and time and energy consumed in replacement have reduced their average yearly rate of drilling by as much as 25 percent in some instances. Where one man could normally care for maintenance of a number of rigs, some contractors find it necessary to keep a man on each rig whose sole responsibility is to keep it running, often on sheer ingenuity and resourcefulness.

Another disturbing factor is manpower. An already critical situation is being aggravated by recent rulings which affect certain classifications of oilfield workers, although many operators are still uncertain as to just what extent they will be affected.

Officials are also concerned about the psychological effect of rapidly fluctuating conditions which result in alternate relaxation and restriction of the flow of materials and manpower.

The PAW program of 8545 wells for District 3 in 1944 has proved to be more than 13 percent greater than actual completions, which on the basis of incomplete figures for December are estimated at 7550 wells. However, unexpected increases in activity in Districts 1 and 2 offset the deficit in District 3 and allowed attainment of the nation-wide goal of 24,000 wells. The goal was upped to 27,000 for 1945, of which it was hoped that 5000 would be exploratory tests. As in 1944, Districts 1 and 2 may make up for the expected deficit in District 3.

Except for war's demand, we are not likely ever again to be exporters of oil on balance for any substantial period of time.. I realize that this viewpoint as a prophecy is subject to considerable hazard. When one lucky wildcat can discover a field with a reserve equal to one tenth of all the oil which has yet been discovered in our nation, the risk inherent in trying to predict our future is obvious.

—E. DEGOLYER,
"Oil for Peace or War."

Lowly Wheelbarrow Loses Dead Weight

DOW Chemical Company is getting out a wheelbarrow made from magnesium. The ordinary heavy-duty wheelbarrow weighs 85 pounds. The Dowmetal product weighs 30 pounds, which means a workman has 55 pounds less dead weight to move. Stated in another way, a workman can move a 355-pound pay load with the same effort that he moved 300 pounds in the ordinary steel barrow. This represents a saving of 18.3 percent, or nearly one fifth in human energy.

Henry Ford in his book "My Life and Work," written nearly 20 years ago, says "There is no more sense in having extra weight in an article than there is in the cockade on a coachman's hat. In fact, there is not as much. For the cockade may help the coachman to identify his hat while the extra weight means only a waste of strength. I cannot imagine where the delusion that weight means strength came from. It is well enough in a pile-driver, but why move a heavy weight if we are not going to hit anything with it? In transportation why put extra weight in a machine? Why not add it to the load that the machine is designed to carry? Fat men cannot run as fast as thin men but we build most of our vehicles as though dead-weight fat increased speed! A deal of poverty grows out of the carriage of excess weight."

In terms of horsepower and wages, it is suggested that through the advantages of light metals, magnesium principally, we may be able to lighten the deadload by one half. Thus man's capacity may be increased by some unknown figure which may run up to 100 percent.

The oil industry is certainly a fertile field for application of these new metals and will eagerly await their application to its many problems where weight and strength of metal determine the solution.

Gain in Oil Earnings May Be Misunderstood

FOLLOWING the publication and tabulation of 9 months earnings reports, the oil industry has been given publicity which may be erroneously construed as meaning that the industry has had excessive profits, it has been pointed out by J. D. Gill, economist and director of The Atlantic Refining Company. These reports have described the oil industry as almost the only large industry to show a gain in net earnings so far in 1944 as compared with 1943. For instance, in a recent major article describing the earnings of the nation's leading companies for the first nine months, the New York *Times* stated, "The increase in the earnings of the companies included in the survey is attributed largely to the petroleum group." And the National City Bank survey of earnings also commented that the petroleum industry was an "important exception" to the relatively stable earnings trend, and added,

"A major share of the gain in total net income for the group was accounted for by the 13 companies in the petroleum industry, which had a 27 percent increase this year in sales . . . and a similar rise in income. Exclusive of the oil group, the net income (of all other groups) was up only 2 percent."

It is unfortunate that the headlines describing such surveys may leave an impression on the public mind that oil companies are "war profiteering." It is doubly unfortunate that there is probably no general realization that to be far ahead of the rest of industry earningwise is an unusual experience for the oil industry. For example, in each of the last five years the oil industry's rate of return on net worth has been lower than that of all industry, and not in the last ten years has the oil industry approached manufacturing and trading, as the following table shows:

Rate of Return on Net Worth

	All Industry	Manufacturing and Trading	Oil Industry
1934	3.5	4.3	2.9
1935	5.0	6.6	5.2
1936	7.3	10.2	7.5
1937	7.2	10.6	10.0
1938	3.8	5.0	4.6
1939	6.2	8.4	5.4
1940	7.4	10.3	6.8
1941	9.4	12.3	8.9
1942	9.0	10.1	6.7
1943	8.7	9.9	8.3

Furthermore, the articles mentioned above are misleading in that, while em-

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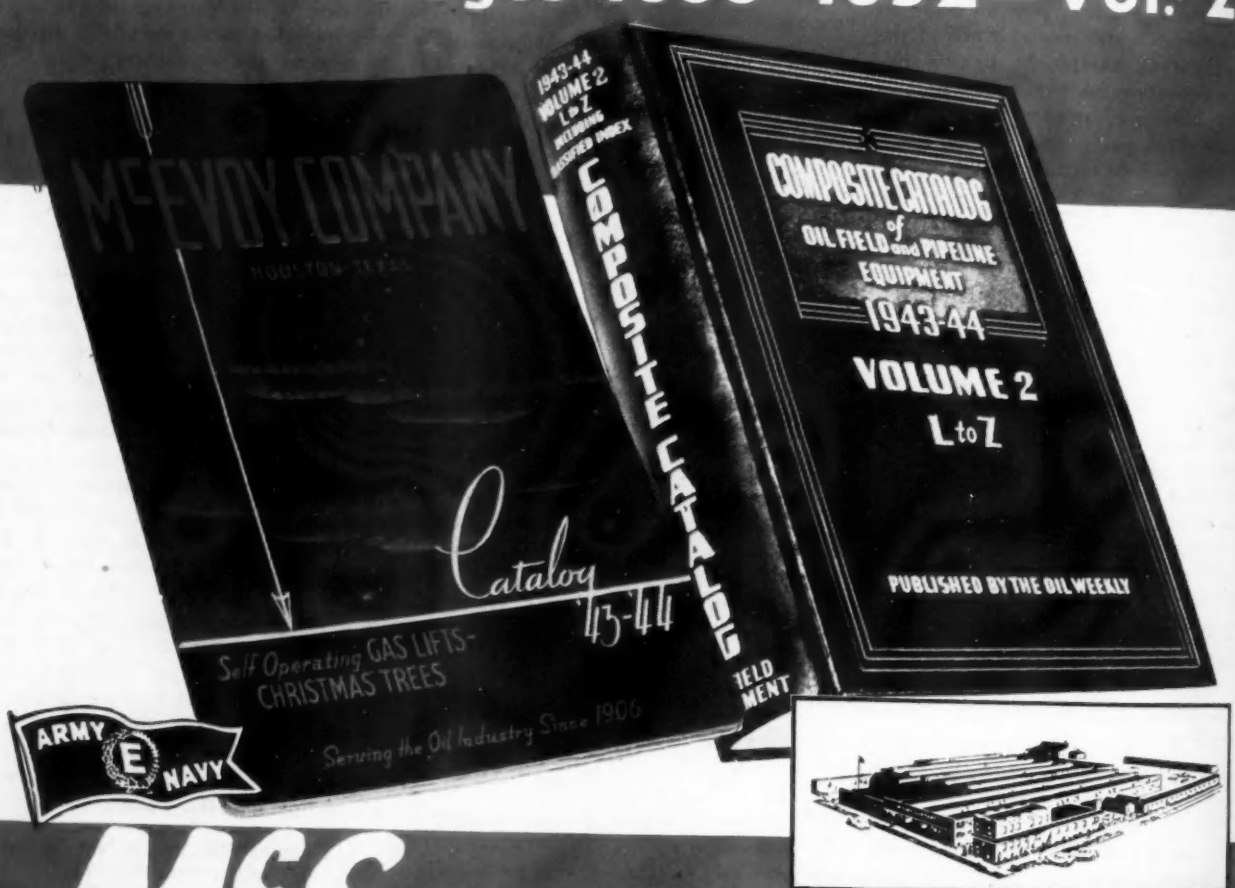

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phasizing the fact that it is the oil industry alone which is responsible for rising earnings of a total industry group, they completely fail to point out that even now, with a substantial gain in profits over 1943, the oil group is still behind the average of all industry with regard to rate of return on net worth. It is not possible to ascertain this fact at all from the *Times* article, but examination of a table accompanying the National City Bank report reveals that for the first nine months of 1944 the oil group earned a rate of return of 8.6 percent, as against 8.9 for total manufacturing and 8.8 for the whole industry group.

Thus it appears that it is only now, after three years of war, that the petroleum industry is beginning to catch up to the good earnings which other industries have been enjoying over the whole period, and not even now has the gap been completely closed.

Economics to Control Fuel for Steamships

FUTURE trends in selection of fuels for merchant marine use will continue to be governed by the economic factors which now favor oil rather than coal. However, under the stimulus of present emergency conditions many previous conceptions and customs concerning marine fuels are undergoing pronounced changes, and this tendency may continue in the postwar competition.

The above views were presented recently at the annual meeting of the American Society of Mechanical Engineers, in New York. David M. Schoenfeld, of Combustion Engineering Company, Inc., and George P. Haynes, chief engineer of Todd Combustion Equipment Division of Todd Shipyards Corporation, authors of the paper covering the subject of marine fuels, noted that "It would not be surprising to find conventional hull arrangements modified to accommodate coal instead of oil. With any shortage of fuel oil and its accompanying increase in its price as compared with coal, the economics of which fuel should be used may be easily reserved, at the same time probably accelerating any tendencies in the hull."

"It has always been hard to translate a creative idea into a going business venture; today's taxes are among the penalties making it almost impossible. Now the maze of tax, price, labor and other regulation, producing great uncertainty, even with expert and costly advice, discourages even the most hardy."

—ENDERS M. VOORHEES,
Chairman, finance committee,
United States Steel Corporation.

Another Oil Price Investigation

THE Office of Price Administration has announced it will initiate studies of cost figures on production and refining of oil, but it is clear that a much longer time may be required to complete the studies and act on them, than the committee suggested as a minimum.

In many respects it seems regrettable that any time or money should be consumed in such studies. For a period of more than two years, OPA has been supplied with facts and figures substantiating the industry's claims that prices for crude oil are too low. The only change that could be possible as far as these facts and figures are concerned, is that they have become more favorable to a price increase as time has passed, as proved by the evidence presented to hearings before Wright Patman's committee on small business.

Just why it should now be necessary to go through lengthy investigation again, taking up precious time and using manpower that is so badly needed for other war activities, is a question not too easy to answer. Justification for this repetition may be possible, but it looks like a waste of time and energy.

However, if through such procedure OPA can be brought to see the oil picture in its true proportions, and that segment of the industry needing help can be given relief, the way may be paved for quicker solution of other problems that are likely to arise before the war is over.

The American Way Of Doing Things

A GREAT tribute to the American way of doing things was spoken recently in New York, under extraordinary circumstances. Miss Lidia Manson, a Russian-born engineer and diesel engine designer, now associated with Clark Brothers Company, speaking before the National Association of Manufacturers annual meeting, reviewed her experiences in Europe just prior to Pearl Harbor. In recounting her misgivings about how a woman engineer would be accepted in this country, she said, among other things: "But there was one thing I hadn't counted on. And that was the American system. For instead of a fighting chance, I found a wide open welcome. America gave me my opportunity."

Comparing research standards in this country and Europe, she observed that "A factory the size of Clark Brothers Company, in Olean, New York, where I am now employed, would in almost any other country content itself with plodding along old and well-tried paths. It would be satisfied to shop around for patents as a means of buying success and never dream of investing in an experimental department. But in America, through industry-sponsored research, anything that looks as if it might work gets a chance. And it doesn't make any difference whether that thing is a newfangled electronic device for testing engines, a book-long mathematical calculation—or a girl.

"My story isn't exceptional," she continued. "The things that happened to me could have happened to anybody—American or foreigner. And it wasn't because chance took me to Penn State or to Clark Brothers. It would have been the same—as you Americans would put it—at Podunk Normal or at Gadget, Inc. The places I speak of I speak of because they are familiar, but the magic thing I found there can be found all over America. And that is opportunity."

These words are all the more impressive because they come from one experienced with old-world systems. That one so new in this country should discover magic opportunity so quickly, ought to make those of us fortunate enough to claim America as our native land, resolve to appreciate it more, and to realize our own opportunity.

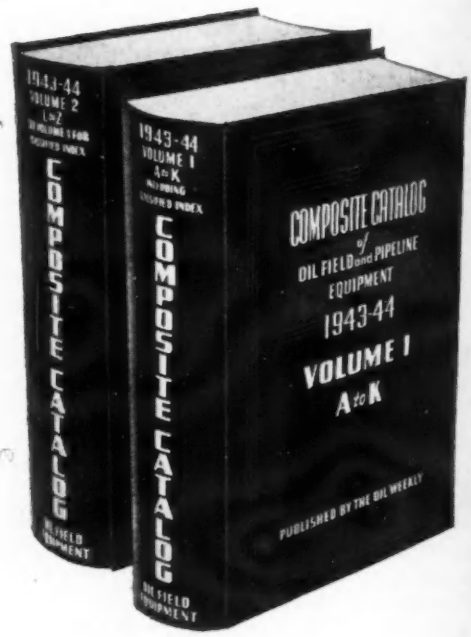
Oil Companies To Go Into Transportation?

RECENT purchase of three transportation systems in the Los Angeles, California, territory by Signal Oil and Gas Company, indicates that oil companies may be a significant factor in transportation development following the war.

In the postwar era movement of freight and passengers by motor vehicles is probably due for considerable expansion. That there will be keen competition among the various methods of transportation, there can be little doubt. Long distance hauling will be influenced notably by the comparatively new agency of air transport, especially where speed is a prime consideration. Also, undoubtedly other wartime improvements will be applied to peacetime transportation.

Integration has proved its value throughout the history of industry, and further application of it is sure to follow when the war is over. By being able to use its own products through operation of its own transportation system, an oil company has completed the cycle from production to consumption.

MORE NECESSARY THAN EVER BEFORE



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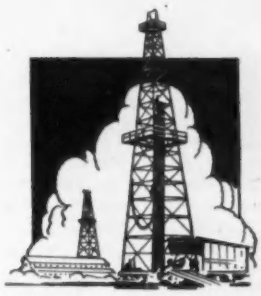

By BERTRAM F. LINZ, Washington Correspondent

A QUIET holiday week brought no important oil developments in Washington, where war agency officials were mainly concerned with the demands for fuel, material and equipment coming in from the European theatre as a result of the German counter-offensive.

Civilian Supplies Affected?—Indicated losses of large quantities of oil products destroyed or captured by the Germans as they over-run our lines may shortly have an effect on civilian supplies in this country, but it is doubtful that any cut in gasoline rations will result in view of apprehensions that the further restriction of civilian automobiles might tend to impede war production.

Taxes and Oil Pact—Congress returns to Washington this week, but with nothing important in the way of oil legislation likely to come before it. The most important item on its schedule is negative—there will be no tax cuts this year, unless conditions change suddenly and drastically for the better. And in the only other oil matter pending, the Anglo-American treaty will be withdrawn shortly for revision.

Roumanian Oil Equipment—Washington had no comment on Russia's explanation of the removal of oil machinery and equipment from Roumania to the Soviet Union. The United States and Great Britain had asked for an explanation of the reported removal of some 26,000 tons.

Helium Use Increased—The Bureau of Mines revealed that despite heavy military requirements and increased commercial consumption, more helium is available now for medical and industrial uses. Government plants are now producing 25 times more helium than before the war.

IPAA After Price Increase—A general average increase in the price of oil of 75 cents per barrel is sought by the Independent Petroleum Association of America in an application to be filed with Price Administrator Chester Bowles.

Increase for Big Inch—Seven companies supplying East Texas crude for the Big-Inch were ordered by PAW to increase January deliveries nearly 5 percent over previously approved movement in order to make up a 5500-barrel daily shortage.

IPAA To Press OPA for General Price Increase for Oil Producers

Members of the Independent Petroleum Association of America are being canvassed for proxies to support a protest against the OPA price regulations covering crude oil and an application for a general average increase of 75 cents per barrel which is to be filed with Price Administrator Chester Bowles on or before January 15.

The protest will be submitted in accordance with regulations adopted at the annual meeting of the IPAA calling for a general price increase and the application is designed to answer contentions of the OPA that no formal request for a general increase is before that office.

The protest also will cover the crude price investigation now being readied by OPA and will request that, in order to avoid difficulties inherent in developing satisfactory information on costs, finding costs on a replacement basis and margin per barrel be determined arbitrarily, based on available economic, statistical cost and income data, by agreement with the industry and advice of a national industry advisory committee.

The IPAA will attack the present regulations, schedules, orders and adjustments as "illegal, arbitrary and capricious" and not in accordance with the law in that they do not:

Stabilize or prevent abnormal petroleum prices;

Eliminate or prevent profiteering manipulation, speculation and other disruptive practices resulting from abnormal market conditions or scarcities involved in the national emergency;

Assure that the defense appropriations are not dissipated by excessive prices;

Protect persons with relatively fixed and limited incomes, consumers, wage earners, investors, etc., from undue impairment of their standards of living;

Prevent hardship to persons engaged in business and to federal, state and local governments which would result from increases in prices;

Assist in securing adequate production of commodities and facilities or permit voluntary cooperation between government and producers, processors and others to accomplish the purposes enumerated in the emergency price control act.

In its petition for a general price increase, the association will urge that "there should be considered together with the economic factors relating to price, the position of the independent producer in relation to the integrated and major company."

"To all producers of crude petroleum there should be permitted a sufficient margin of profit over finding, developing and producing costs of crude petroleum to enable producers to obtain proper compensation for capital invested and risk involved and to continue in the production of crude petroleum, find adequate reserves and make available supplies at maximum efficient rates to meet war, industrial and essential civilian requirements and establish within this country sufficient underground reserves from which above-ground supplies may readily be made available to assure the security and peace of this country," IPAA will declare.

PAW Orders Increase in Deliveries to Big-Inch

Seven companies supplying East Texas crude for the Big-Inch pipe line were ordered by PAW last week to increase their January deliveries by 4.6 percent over their previously approved movement in order to make up a 5500-barrel shortage in the scheduled 318,000-barrel daily movement.

The additional oil is to be taken out of the volume moved south to Gulf Coast refineries by The Atlantic Refining Company, Cities Service Oil Company, Gulf Refining Company, Magnolia Petroleum Company, The Pure Oil Company, Shell Oil Company and Sinclair Prairie Oil Marketing Company.

The January-March schedule drafted by PAW calls for the movement of 318,000 barrels of crude daily through the line during the first three months of this year.

Drilling Rig Spare Parts Stressed in PAW Change

With a view to keeping all present drilling rigs in operation, PAW has under drafting an amendment to P-98-B which will stress repair parts for drilling rigs rather than complete units.

It is proposed to require operators to obtain the approval of PAW district officials for the use of the top **AA-1** rating to obtain complete units, although

they may use the next rating of AA-2-X without such authority. The use of the lower rating, however, means a difference of two weeks to three months in delivery time.

No formalities will be required for the acquisition by operators of repair parts for rigs, and PAW officials are hopeful that operators will renovate any broken-down rigs they may have that are capable of repair before seeking speedy delivery of complete new units.

Memphis Gas Extension Is Halted by Injunction

The United States circuit court of appeals in New Orleans, Louisiana, on December 22, issued an order temporarily halting the construction of Memphis Natural Gas Company's additional facilities for furnishing natural gas to the Memphis area.

The Federal Power Commission had previously issued a permit to the Memphis Natural Gas Company for additional lines in Arkansas, Mississippi and Louisiana. This would allow Memphis to meet the requirements of its customers by building 49.5 miles of 20-inch gas line from the North Lisbon field to their compressor station in the Monroe field, and by looping parts of its line from the Monroe field to Memphis at an expenditure of $2,553,000.

The Louisiana Public Service Commission sought a stay of the order as the commission objected to piping gas out of the state but the FPC denied the request. The commission then applied to the courts for injunction.

Humble Asks Rehearing On Ingleside Injunction

Humble Oil & Refining Company continues its fight against the probability of being forced to include the maintenance of membership clause in its Ingleside refinery contract with the CIO union, following the dissolving of its injunction to prevent government intervention. The company will file a motion for rehearing before the United States fifth circuit court of appeals in New Orleans, and if, as expected, the motion is denied, will file for a writ of certiorari from the United States Supreme Court. Such a writ would require the lower court to bring the case before the superior court for review.

The appelate court had dissolved the injunction on the grounds that the district court had no jurisdiction over agencies and parties domiciled in Washington who were named in Humble's petition. The company's contention was that the district court has jurisdiction over those who would enter Texas to seize control of a Texas plant.

Increase in Refiners' Daily Production Seen

Amendment of petroleum distribution order No. 21 effective January 1, paved the way for an increase of possibly 60,000 barrels in refiners' daily production of premium motor fuel. But PAW officials announcing the order warned last week that civilian motorists need not expect to benefit.

All of the additional production is to be distributed only to buses, fire engines and other essential vehicles. It was said.

Explanation Is Asked on Removal by Russia of Roumanian Oil Equipment

A new rift between Russia and the western allies was disclosed last week to have resulted from reports that Soviet forces were sending machinery and equipment from the Roumanian oil fields to Russia.

There was little information regarding the matter in Washington beyond the fact that the United States and British governments had made diplomatic requests to Russia for a full explanation of the situation.

It was not disclosed how much or what type of equipment had been removed, but it was reported to be in the neighborhood of 26,000 tons.

Diplomatic inquiries are said to have brought from the Russians an assurance that the interests of the United States and the United Kingdom would be respected and that the Roumanian fields would be developed in the interests of the Allied war effort, together, reportedly, with an explanation that the equipment removed was from the properties of German companies which before the war controlled about 23 percent of the Roumanian output. American and British companies controlled about 65 percent of the prewar production of some 5,000,000 tons.

Officials in Washington admitted that they knew little about what has transpired in the Roumanian fields since the Russians took over, due to the fact that our representatives on the Allied control commission for Roumania have been denied the freedom of movement which has been accorded Soviet officials in Italy. For this reason they are anxious to get a detailed explanation from the Soviet as to what has been done in the oil fields.

The reported Russian explanation that the equipment was taken from German properties to replace that destroyed by the Germans when they invaded Russia in an effort to seize the Caucasian oil fields was received in Washington without comment, officials apparently planning to say nothing until they have more detailed information.

Mid-Continent Groups To Discuss Tax Matters

Mid-Continent Oil & Gas Association has called a general meeting of the association's standing committee on state and local taxation for Thursday and Friday, January 18-19, at the Blackstone Hotel, Fort Worth, Texas.

Purpose of the meeting is to consider a number of important matters now before each of the steering committees.

The first morning's session will be called at 10 o'clock, and the tentative program includes sessions for Thursday afternoon, Friday morning, and Friday afternoon.

The general meeting will be strictly a business meeting, designed for the presentation, consideration and discussion of current state and local tax problems affecting the petroleum industry in the areas covered by the activities of the steering committees of the standing committee on state and local taxation. All sessions will be executive. There will be no entertainment, luncheons, or other social features connected with the general meeting.

Commercial Market of Helium Sees Increase

New uses for helium, developed chiefly in the aircraft industry, increased the commercial market for the gas to more than 250,000 cubic feet a month last year, it was reported by the Bureau of Mines December 30.

Beyond saying that the five government-owned helium plants now are producing more than 25 times as much gas as before the war, the bureau gave no information regarding output, but reported that commercial distribution of 279,215 cubic feet in the first quarter of 1944 increased to 918,955 cubic feet in the following quarter. Despite heavy military requirements and increased commercial consumption, the bureau said, there are even greater quantities of helium available for industrial and medical uses.

Texas Gas Waste Drops to 2 Percent, Says Thompson

Waste of Texas gas has dropped from 37 percent of production in 1935 to 2 percent at the present time, Texas Railroad Commissioner Ernest O. Thompson declared last week in a statement based on figures supplied by processors and producers.

"Most of the gas that is being wasted comes out of wells producing oil," said Thompson, adding that "We cannot be said really to be wasting any great percentage of our Texas gas."

Thompson said the roundup of production and utilization showed this distribution: Light and fuel, including gas transported by pipe line to Denver, Indianapolis, Chicago, St. Paul, Kansas City, Detroit and points in New Mexico, Tennessee and West Virginia, 36 percent; extraction loss in natural gasoline plants, 4 percent; fuel in such plants, 10 percent; repressuring of fields and recycling, 28 percent; used in lifting crude oil from the wells, 4 percent; manufacture of carbon black, 16 percent; and waste, 2 percent.

Answering the criticism of the uninformed, who note the flares in oil fields and express the opinion that such gas should be saved, Thompson said that "if you told them you would give it to them if they would pipe it away, they would find it too costly to come and get it."

Thompson declared that nearly all the development of a market for Texas natural gas has come about in the past 20 years; that people had to become educated to its use. He added that some states had sought unsuccessfully to prevent importation of Texas natural gas but that it gradually has taken on more value since its general use has been developed and today its true value is beginning to be realized.

WPB Making Program for Indefinite Continuance of War Against Germany

War agency officials, confronted with new military requirements as a result of the German counter-offensive, now are programming their activities on the basis of indefinite continuance of war in Europe and are devoting all efforts to replacing the material lost by our troops as the Germans advanced and in producing new equipment, some of which gives indications of a belief on the part of military leaders that the hitherto mobile conflict may resolve itself into trench warfare before the end of the winter.

War Production Board officials have ordered that production of civilian commodities in the first quarter of 1945 is to be kept at the levels of the final three months of 1944, and all programs of WPB industry divisions calling for increased output have been cut back. The spot authorization program for civilian production with the use of manpower and facilities not needed for war contracts has been frozen in 126 areas, and the increased output which will come from other sections where it still may be applied is expected to be a mere trickle.

All plans for the reconversion of industry and expansion of civilian production "after V-E Day" have been tossed out the window and will not be retrieved until victory over Germany is definitely —and not merely apparently—imminent.

As a result of loose talk last fall about the early defeat of Germany, thousands of workers left the war plants to search for permanent peace-time jobs before the rush which they feared would occur on V-E Day, with the result that the increased military demands which are now coming in are being filled only with great difficulty.

Manpower and facilities are the two bottlenecks now impeding war production, officials said. The materials situation is somewhat easier with respect to a number of items, but surpluses which have developed cannot be used for civilian goods because of the lack of labor and machinery.

Military Demands Cause Truck Program Cutback

Increased demands for military transport have necessitated a cut-back of 20 percent in the WPB truck-construction program for 1945, and ODT officials estimate that less than one-fourth of the carriers needed to meet essential war and civilian transportation requirements will be built and distributed to commercial operators.

Instead of the 235,905 trucks tentatively programmed a few weeks ago, only 186,792 will be produced this year, it was disclosed. Estimated requirements were placed at 773,935.

A break-down of the approved 1945 program shows that instead of the 13,122 heavy trucks planned to be produced against needs for 23,125, only 9765 actually will be built; 31,464 light heavy trucks will be produced instead of the 49,750 proposed against requirements of 97,092; 109,859 medium trucks instead of 134,901 and requirements for 354,118, and 35,704 light, instead of 38,132 against requirements for 299,600.

Gas Association to Open Office in Washington

John A. Ferguson will open an office in Washington, D. C., for the Independent Natural Gas Association of America in the near future. He was recently elected executive director of the association. He holds a degree in law from Indiana University. Subsequent to the World War I, he became United States commissioner for the eastern district of Missouri. Later, he was with the finance department of the state of Missouri, and for six years he served as general manager of the Mathews-Pebblefield Land Development Company. He became a member of the Missouri Public Service Commission in 1935 and has served with the commission since that time.

John A. Ferguson

Much 1945 Legislation About Tax on Gasoline

Fiscal arrangements for postwar highway rehabilitation and development, constitutional dedication of state highway funds to highway purposes; threats of gasoline and other motor vehicle tax increases; broader motor vehicle reciprocity and more liberal state sizes and weights regulations feature 1945 legislative forecasts from 44 states to the National Highway Users Conference. The effect of many of these proposals would be to make permanent war-time liberalization of restrictive motor vehicle statutes.

Only four states, Kentucky, Louisiana, Mississippi and Virginia have no regular legislative sessions next year.

Plans for renewed highway development during the biennium covered by most sessions are expected to revolve around the $1,500,000,000 federal-aid program just approved by Congress for the first three postwar years, although some states report road programs of much longer duration. State highway fund surpluses total approximately $450,000,000 aside from debt obligations with greatest accumulations in such states as Pennsylvania, California, Texas, North Carolina and Virginia.

Legislation to give voters the opportunity of amending their state constitutions to protect highway funds is proposed in 18 states: Alabama, Arkansas, Connecticut, Georgia, Illinois, Indiana, Maryland, Massachusetts, New Mexico, New York, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Wisconsin and Wyoming. In some of these states, as well as others, statutory protection of highway funds is being urged as second choice and the need for money to match Federal-aid highway funds is expected to be an additional argument against diversion.

Diversion itself is expected to be a major issue in eight states: Arkansas, Delaware, Illinois, New Jersey, New York, Ohio, Oklahoma and Rhode Island.

Threats of increases in gasoline tax rates are reported from 19 states: California, Colorado, Connecticut, Illinois, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, Ohio, Pennsylvania, Texas, Utah, West Virginia and Wisconsin. Reports of other motor vehicle tax increases come from 15 states: Arkansas, Colorado, Connecticut, Idaho, Illinois, Iowa, Kansas, Michigan, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma and Texas.

Reflector Warnings Are Permitted Another Year

The Interstate Commerce Commission has extended for one year the authority to use reflector warning devices on tank trucks carrying inflammable compressed gasses or inflammable liquids.

An ICC order of October 5, 1943, authorized the alternative use of reflectors meeting stipulated specifications up to December 31, 1944, on trucks operated in interstate, foreign or intrastate commerce by common, contract and private carriers under its jurisdiction.

Drilling Halted on Record Deep Well

Standard Oil Company of California announced December 29 it was stopping further drilling in its "world's deepest well" near Taft, California, at 16,246 feet.

No commercial accumulations of oil were found in the lower part of the hole, although there were showings reported behind the casing, which runs to 10,999 feet. These are to be tested before final abandonment.

The well, KCL 20-13, is located in the heart of the southern San Joaquin Valley oil territory. Nearby fields produce oil from many strata of Pliocene and Miocene ages. The formations of Pliocene age which are productive in the Buena Vista hills and Midway district proved barren in KCL 20-13. Below 8000 feet, the Miocene formations which yield oil at the nearby Coles Levee and Ten Section fields likewise proved barren. Finally the well penetrated the part of the lower Miocene which includes the Vedder sand, productive at numerous fields on the east side of the San Joaquin Valley, such as the Greeley, Rio Bravo and Mt. Poso fields. This deep zone likewise was found to be non-productive.

Failure to find commercial oil zones, plus indicated operational difficulties were responsible for cessation of drilling.

October Production of Natural Gasoline Gains

Daily average production of natural gasoline and allied products reached 12,045,000 gallons in October, compared with 11,827,000 gallons in the preceding month and 11,323,000 gallons in the corresponding period last year, it is shown by the monthly report of the Bureau of Mines.

Production gains occurred in West Virginia, Kansas, Kentucky, Pennsylvania and Ohio, closely related to the seasonal trend demand for natural gas, the bureau stated.

Output of light products in October included 191,898,000 gallons of natural gasoline, against 186,438,000 gallons in September 76,104,000 gallons of cycle products, against 70,518,000 gallons; 18,312,000 gallons of iso-butane at natural gasoline and cycle plants, against 17,472,000 gallons; 87,066,000 gallons of other liquefied petroleum gases at natural gasoline and cycle plants, against 80,388,000 gallons; 17,388,000 gallons of liquefied refinery gas at refineries, against 15,708,000 gallons, and the usual 8,400,000 gallons of benzol.

A slight increase in over-all stocks was registered during the month, a drop from 91,308,000 to 89,544,000 gallons at refineries being more than offset by a gain at plants and terminals from 82,614,000 to 85,176,000 gallons.

1944 Revenue from Oil Industry Registers Gain

Federal revenue from the gasoline tax dropped $5,600,000 in November, to $33,114,838 from $38,734,828 in October, but were $9,500,000 above the $23,575,563 recorded for November, 1943, it was reported December 28 by the Internal Revenue Bureau.

Receipts from pipe line transportation also declined, from $1,400,157 to $1,328,638, but were well above the $976,550 of November, 1943, while the tax on lubricating oils returned $6,750,244, a new high, $800,000 above the $5,819,427 obtained in October and more than double the November, 1943, total of $3,292,418.

Collections for the full year from all three items will be well above those of 1943, the bureau indicated in figures showing that gasoline tax receipts for the eleven months ended with November aggregated $288,843,236 against $240,728,248 in 1943; lubricating oil paid $47,785,167 against $43,904,865, and pipeline transportation returned $14,875,686 against $12,702,360.

Price Increase Allowed For Old Ocean Crude Oil

A 12-cent increase in the ceiling price for crude from the Old Ocean field in Brazoria and Matagorda Counties, Texas, was announced by the OPA last week, to become effective January 1.

The increase, from $1.36 to $1.48 per barrel, will bring the field up to the level of prices for other Gulf Coast crude of like quality, it was explained. The additional cost will be absorbed by the buyers of the oil and not passed on to the public.

The field has a daily current production of approximately 15,000 barrels, it was said.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Dec. 30	Dec. 23
Alabama	250	250
Arkansas	80,750	80,900
California	885,300	885,200
Colorado	8,750	8,850
Florida	50	50
Illinois	202,900	204,100
Indiana	12,250	11,550
Kansas	271,100	279,250
Kentucky	29,750	29,350
Louisiana	360,850	360,900
North Louisiana	71,200	71,250
South Louisiana	289,650	289,650
Michigan	52,500	52,650
Mississippi	52,100	52,100
Missouri	100	100
Montana	24,180	23,360
Nebraska	1,000	1,000
New Mexico	105,700	105,700
New York	13,250	12,050
Ohio	6,250	7,950
Oklahoma	360,000	359,400
Pennsylvania	32,550	32,100
Tennessee	35	35
Texas	2,111,550	2,111,550
Upper Gulf Coast	552,900	552,900
East Texas Field	371,000	371,000
Rest of Eastern Texas	141,450	141,450
Lower Gulf Coast	246,450	246,450
Southwest Texas	79,000	79,000
South Central Texas	20,100	20,100
West Texas	471,300	471,300
North Texas	140,600	140,600
Panhandle	88,750	88,750
West Virginia	7,550	7,500
Wyoming	95,900	95,950
Total United States	4,714,615	4,721,845

Kansas Responsible for Decrease in Production

United States crude oil production averaged 4,714,615 barrels daily during the week ended December 30, reports to THE OIL WEEKLY indicated. This was a decrease of 7230 barrels from the average of the previous week.

Principally responsible for the decline was Kansas, which registered a decrease to 271,100 barrels daily from 279,250 per day the week before. Illinois was off a little to 202,900 daily from 204,100.

Other states produced at the same rates as in the preceding week or showed only very slight changes.

Civilians to Receive Less Butane Gas This Winter

Civilian consumers of butane and propane-butane mixtures will receive only limited quantities of the gases this winter and were warned by PAW last week against using more than their minmium essential requirements.

Administrator Ickes pointed out that the liquefied petroleum gas situation is tight and that butane is an important component of 100-octane aviation gasoline and used as fuel in industrial plants making small ammunition, guns, plane parts and other war materials. He declared that every effort is being made to distribute the available supplies equitably among all civilian consumers, but they can have only those limited quantities remaining after military demands are met.

Supplies are particularly tight, he said, in Alabama, Mississippi, Georgia, Florida, Louisiana, Texas, Arkansas and Oklahoma.

Subsidy Payments Schedule Changes Announced by OPA

Changes in the schedule of pools receiving subsidy payments were announced by the OPA December 26, with 23 stripper pools added to the list as of December 1.

Errors in a recent collection of pools qualifying for increases are corrected by restoring two Knox County, Indiana, pools to their original and correct premiums, St. Francisville East to 20 cents and St. Francisville to 35 cents per barrel. Whitetail Pool, Osage County, Oklahoma, inadvertently omitted from the list, is restored, with its premium of 35 cents.

Among the December 1 changes is an increase, from 20 to 35 cents per barrel, for Barnett Creek pool, Ohio County, Kentucky, the Sharon Ridge pool, Scurry and Mitchell Counties, Texas, formerly given a premium of 25 cents, is divided into two zones, the Sharon Ridge 1700-foot zone to receive 35 cents, and Sharon Ridge 2400-foot zone to receive 25 cents.

Two pools, Shiells Canyon (deep zone) pool, Santa Paula-Newhall, California, and the Pursely pool, Jack County, Texas, were deleted as not qualifying for the stripper well premium, and Lost Springs West pool, Marion County, Kansas, also was deleted after having been included erroneously.

The new pools added to the list as of December 1 were as follows:

California: Coalinga-Oil City, San Joaquin Valley County, 20 cents; Devil's Den, San Joaquin, 35 cents; Belridge North (shallow), San Joaquin, 20 cents; Elwood (Monterey), Santa Barbara, 20 cents; Moody Gulch, Santa Clara, 35 cents; Newport, Los Angeles Basin, 25 cents; Kendon, Kern, 25 cents.

Illinois: Cisne North, Wayne, 35 cents; Tamaroa, Perry, 35 cents.

Kansas: Retting, Elk, 35 cents.

Kentucky: Cairo, Henderson, 35 cents.

Michigan: Chase, Lake, 25 cents.

Montana: Conrad-Midway, Pondera, 25 cents.

New Mexico: Skelly, Lea, 20 cents.

Oklahoma: Hensley, Okfuskee, 25 cents; Cement (Pardian), Caddo, 35 cents; Simmons, Muskogee, 35 cents; Mervine South, Kay, 35 cents; Tahola, Muskogee, 35 cents.

Texas: Bob Rose, Caldwell, 35 cents; Aspermont, Stonewall, 25 cents.

Virginia: Lee County, Lee, 75 cents.

Wyoming: Mule Creek East, Niobrara, 20 cents.

Prices on Oil-Well Rubber Specialties Are Curbed

Prices for oil-well rubber specialties will be kept under strict control by the OPA, which on December 26 excepted those and certain other items from a recent authorization allowing manufacturers who have substituted Buna-S for natural rubber in molded and extruded mechanical goods to adjust their maximum price on those products to equal current factor cost plus cash discount.

In addition to oil well specialties, manufacturers will not be permitted to adjust their own maximum prices on brake linings and clutch facings; flooring, mats and matting; foamed-latex products, hard or sponge rubber goods or rubber covered rolls, all items used for the most part on industrial machinery and consumer durable goods.

Tax Review

A Regular Feature of THE OIL WEEKLY
By WILLIAM O. TAYLOR*

This column is designed to review legislation, judicial decisions, administrative rulings and policies, and topics which are of current interest to the oil industry, from a tax viewpoint. It will be published as frequently as new developments seem to require.

Tax Court Extends "Acquisition" Well Rule

UNDER the so-called "acquisition" well rule, established in *State Consolidated Oil Company v. Commissioner,* 66 F (2d) 648, *Hardesty v. Commissioner,* 127 F (2d) 843, and related cases, an oil operator could not, prior to 1943, deduct drilling costs incurred on a well if the drilling of the well constituted part or all of the consideration for acquiring an oil and gas lease. Instead, such costs were required to be treated as cost of the lease and recovered through depletion allowances or charged off when the lease was sold, abandoned, or became worthless. The rule was evolved without the aid of any statute or regulation expressly pointing to that result. The government was highly successful before the courts in sustaining its application of the rule and was continually broadening its scope.

However, effective with taxable years beginning after December 31, 1942, the regulations were so amended as to materially limit the scope of the rule. Now an operator may deduct drilling costs to the extent of the fractional part of the working interest which he acquires by drilling the well. Thus, if he drills a well for an assignment of three fourths of the working interest, he may deduct three fourths of the drilling costs. But it appears that the detrimental effect of the old rule may be magnified and extended in some cases far beyond 1942 if the decision in *D. B. McDaniel v. Commissioner,* a tax court memorandum opinion handed down August 7, 1944, is correct.

In the earlier cases referred to above, the sole question involved was the applicability or non-applicability of the option granted by Article 23(m)-16 of Regulations 103 and corresponding provisions in prior regulations. Since the option (to expense or capitalize) dealt only with intangible costs, it was thought that the rule established in those cases had no bearing on the treatment, for tax purposes, of equipment costs. Such costs were deemed to be capital outlays, subject to depreciation. Indeed, in the *State Consolidated* case, the government conceded that the taxpayer was entitled to depreciation on equipment installed in the wells there involved, although it successfully contended that the wells were "acquisition wells" and that the intangible cost could not be charged to expense.

Treated as Cost of Lease

In the *McDaniel* Case, the taxpayer acquired two leases by an assignment which required him to drill a well on one of the leases. The well was drilled in 1936 and proved to be non-productive. The leases were re-assigned to the original assignor in 1937, at which time some casing and other equipment remained in the hole. The taxpayer claimed a deduction for the equipment cost in 1937 and the government contended the deduction should have been taken in 1936, apparently on the theory that it was abandoned when the well proved non-productive. The tax court sustained the taxpayer on the ground that the cost of equipping the well, just as the cost of making the hole, was controlled by the rule of the earlier cases; *and that the equipment cost should be treated as cost of the lease,* to be recovered through depletion or through disposal of the lease by sale, abandonment, etc.

The decision does not seem to be justified by the earlier cases, and it remains to be seen whether the government will attempt to apply it in an instance where the well was a producer and the lease was retained. Application of the rule under such circumstances would mean that no depreciation will ever be allowed on equipment in a well which was drilled prior to 1943 and was an acquisition well. The amount of depletion based on lease cost would, of course, be greater, but this is small comfort if, as in many cases, depletion based on a percentage of income is greater.

Under the new regulations effective in 1943, the same fractional part of equipment costs as that part of the working interest *not* acquired must be treated as cost of the lease. Thus, an operator who drills a well for assignment of three fourths of the working interest must treat one fourth of the equipment costs as well as one fourth of the drilling costs as cost of the lease. In view of the theory on which the new regulations seem to be based, most tax men seem inclined to go along with such treatment of equipment costs. But the *McDaniel* case involves a year prior to the effective date of the new regulations and there is good reason to believe the decision is unsound.

When Number of Wells Specified

In its early stages, the "acquisition" well rule was thought to be applicable only if the operator was firmly obligated to drill. The rule was soon extended, however, to include instances where the operator was required to drill in order to hold the lease beyond a specified time, although he could refrain from drilling with no penalty other than termination of the lease. The length to which the rule was being further extended, prior to the amendment of the regulations, is exemplified by the memorandum opinions of the tax court in *Tripplehorn v. Commissioner* and *King Oil Company v. Commissioner,* decided on May 4, 1943, and September 27, 1944, respectively. The leases involved in these cases required more or less continuous drilling until, in one instance, as many wells had been drilled as the Texas Railroad Commission would permit and, in the other, until a well had been drilled on each 20-acre tract included in the lease. In each case, failure to comply with the drilling requirement would result in termination of the lease except as to a specified number of acres around each then producing well. The tax court held that each well drilled in compliance with the terms of the lease outlined above was an "acquisition" well and the drilling cost could not be deducted. If the lease had merely provided, as is usually the case, that the lessee would reasonably develop the property after discovery of oil, the cost of drilling the wells necessary reasonably to develop the lease would have been deductible even though the number of wells drilled and the spacing pattern had been exactly the same as they were in the above cases. The fact that the leases specified how many wells should be drilled resulted in a very different and disadvantageous result tax-wise. It should be noted that "acquisition" well rule is still applicable to taxable years which began prior to January 1, 1943.

Sometimes Helpful

Although the "acquisition" well rule is detrimental to taxpayers in most instances, it may be helpful under certain circumstances. If such a well is drilled in a loss year and the lease on which it was drilled is surrendered or lapses in a subsequent year in which the taxpayer has taxable income, application of the rule *may* result in the drilling cost (treated as cost of the lease) being carried over into the subsequent year and charged off against that year's taxable income. Whether such will actually be the case will depend upon which is the proper year for deducting the lease cost, a question which will be taken up in a forthcoming issue of this column.

The rule may also operate to the advantage of a taxpayer corporation in connection with its excess profits tax, if the tax is computed on the income method. Under that method it is, of course, desirable that the net income for the years 1936-1940, inclusive, be as large as possible. Suppose an "acquisition" well in one of those years proved to be dry and the lease was surrendered in the same year. In the taxpayer's records, the drilling cost was probably set up in an expense account called "intangible development cost" or "dry holes." In view of the fact that the lease was surrendered in the same year, it may well have been that the person who prepared the return or the government examiner did not go through the formailty of re-classifying the expenditure as a loss on the abandoned lease, which it actually was, since the amount of tax liability for the year would not have been changed. But it may make a decided difference when base period net income is being calculated in connection with the excess profits tax for some later year. For that purpose, the deduction for cost of abandoned leases is disregarded, which is desirable for the reason that it increases base period net income. It is important, therefore, that the deduction be properly classified.

As a result of such proper classification, the charge-off due to intangible development costs will be decreased in the same amount as the charge-off due to the abandonment of leases is increased. This, too, may be beneficial from the standpoint of the excess profits tax. It will be recalled that intangible development expenditures may be disregarded in any one of the base period years to the extent that they exceed 125% of the average amount of such expenditures in the four preceding years. Therefore, if by reason of proper classification the amount of the intangible development cost deduction is decreased in any base period year except the last one, there is more likelihood that a subsequent year in the base period will have part of

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its deduction for such expenditures disregarded due to the 125% rule.

In view of the fact that what constitutes an "acquisition" well was never very clearly defined (and still isn't) and the further fact that the scope of application of the rule was continually broadened up to 1943, taxpayers might do well to review their returns back to 1936 for possible tax savings.

Appropriations for PAW To Be on Smaller Scale

Barring developments which will call for increased activity, PAW will turn $1,000,000 of its current $6,000,000 appropriation back to the Treasury at the close of the fiscal year on June 30 next. This sum, Deputy Administrator Davies said, will be in addition to the $490,000 the agency voluntarily eliminated from its budget when its appropriation was under consideration. Savings have been made possible through a 27 percent reduction in personnel.

The administration's budget for the fiscal year beginning July 1, next, will be submitted to Congress early in January. However, if the practice followed so far through the war period is continued, the appropriations for the several war agencies will not be included in the main budget, but will be submitted later when a more definite picture of their future activities can be drawn, but in view of the cuts PAW has made in its spending it is probable that its appropriation for the next fiscal year will be on a much smaller scale.

Reporting the saving to Representative Clarence Cannon, chairman of the House appropriations committee and before which PAW and other agencies must justify their budgets, Davies explained that two factors have accounted for the economy record.

"On the one hand," he said, "our continuing review of organization and administrative procedures has revealed additional opportunities for streamlining the flow of work, eliminating duplication of effort and clarifying divisional staff responsibilities.

"At the same time, we have done everything possible to simplify and relax various wartime controls and regulations relating to petroleum industry operations. The results of our efforts in this direction have substantially lightened our administrative burden, both in Washington and in the five district offices."

Davies emphasized, however, that sufficient personnel must be maintained to insure the armed forces the products they need, as well as to meet essential needs on the home front, and indicatd that the scaling-down process might not continue at the same rate. PAW, he said, will have many important functions to perform until both the European and Japanese campaigns are ended.

Shipments to West Coast Are Increased from Texas

PAW has authorized an increase of approximately 1000 barrels per day in the shipment of West Texas crude to the Pacific Coast. Originally 5 carloads per day were leaving The Atlantic Refining Company's loading rack at Midland, Texas, but this was increased December 27 to 10 cars and on January 2, the daily shipment will be increased to 15 cars.

Pioneer U. S. Producer

The old Barnum Buell well, in Noble County, Ohio, near the village of Macksburg. Drilled in 1862, the well still yields enough oil to be classed as a commercial producer. It is 495 feet deep, and is said to be the oldest producer in the world. Present owners are Eagler and Fischer, of Macksburg, Ohio.

Hull Calls Saudi Arabian Pipe Line a Sound Project

The proposed pipe line outlet for the Saudi Arabian oil fields is a sound project for construction after the European war is over in the opinion of Burt E. Hull, The Texas Pipe Line Company president, who was member of a party which recently inspected the proposed site for construction. The project would cost an estimated $100,000,000.

Among the party which left the United States on November 1 besides Hull were L. N. Hamilton, Bahrein Petroleum Company; W. J. Lenahan, Arabian-American Oil Company; Oscar Wolfe, The Texas Company; H. H. Hall, Sidney Johnson, John A. Rumsey, Standard Oil Company of California and C. M. Rosebrugh, Gulf Refining Company.

Hull thought the United States is the only country capable of building this line because it alone could roll pipe of sufficient size. Although transportation and manpower would be tremendous problems at present, the postwar period should find these obstacles somewhat lessened.

The line as now proposed, would be a combination of 24 and 26-inch pipe and would run from the Saudi Arabia field to a point on the West Mediterranean. Another plan would extend the line to Egypt, the extension to involve an additional expenditure of $30,000,000. In the opinion of Hull this would offset the saving in tanker transportation by providing better facilities.

The line was first proposed as a project to be constructed by the United States government but met considerable opposition although supported by the Army and Navy and State Department. If built, financing now likely would be shifted to private capital.

Hearing February 8 on Texas-Monterrey Gas Line

The Federal Power Commission has scheduled a hearing for February 8, in Washington, on the application of the Reynosa Pipe Line Company for authority to construct 30 miles of 12¾-inch pipe line from the La Blanca gas field, Hidalgo County, Texas, through north and south Weslaco fields to the Rio Grande river, with 3000 feet of 8⅝-inch parallel lines across the river to the international border to connect with a 14-inch line of Gas Industrial de Monterrey, S. A., to which it has agreed to sell and deliver up to 60,000 million cubic feet of gas per day for distribution in the vicinity of Monterrey, Mexico.

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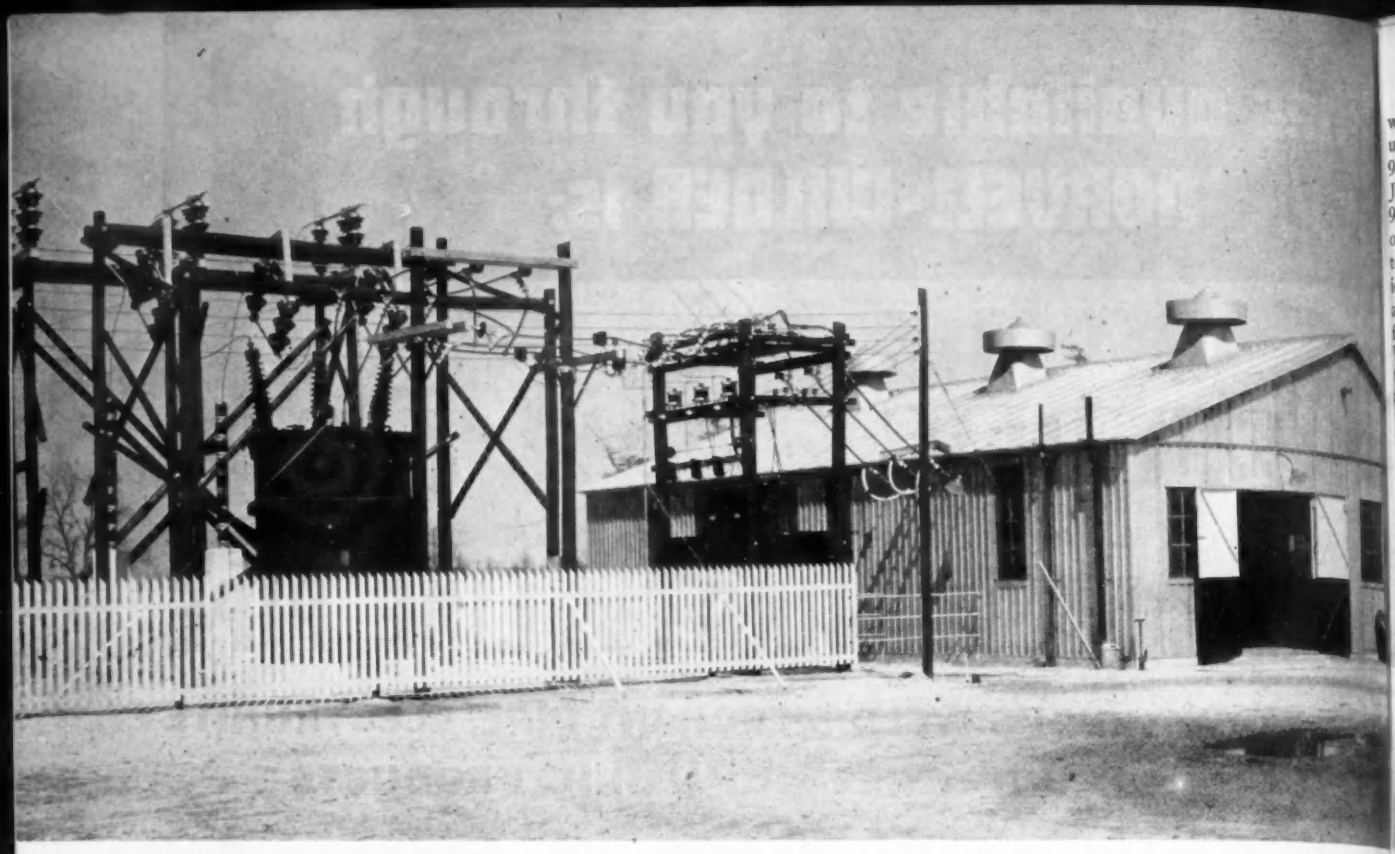

A typical station on the Big-Inch shows, in the wooden construction of the substation structure, how much of a "war baby" the line was when critical materials were concerned. The sheet iron building, housing three pumps and their motors, is said to contain more horsepower per square foot of floor area than any previous stations. The gate between the substation and building is to prevent accidental contacting of the high-tension wires at the point where they enter the building.

Operating Experiences on the Big Inch Lines

By W. H. STUEVE, Oklahoma Gas & Electric Company
Formerly Power Consultant for War Emergency Pipelines, Inc.

THERE has been, up to the present time, very little information made public regarding the actual operations of the 24-inch or Big-Inch pipe line which was constructed by the War Emergency Pipelines, Inc., to feed crude oil to the East Coast and to combat the submarine peril which threatened the supply of crude to that vitally important industrial section of the nation. The information which is now available can serve to determine the actual capacity achieved and resultant efficiencies of the equipment installed along this artery which is doing so much to help win the war.

In March, 1943, the Big-Inch was handling crude oil from Longview, Texas, to Norris City, Illinois, pumping through 11 stations and the crude was reloaded into tank cars at Norris City for shipment to the East Coast. Also about that time, the War Emergency Pipelines, Inc., was authorized to proceed with the extension from Norris City, about 700 miles farther to the East Coast, with a terminal at Marcus Hook and another terminal at Elizabeth, New Jersey. At this time it was pretty generally understood that the 20-inch products line, known as the Little Big-Inch, would be authorized to start from Houston and Beaumont, thence north to Little Rock, Arkansas, where it would join the right-of-way of the Big-Inch line and pass to the East Coast with the same terminal facilities mentioned above, all for the delivery of gasoline, kerosine and other refined products.

Information now available throws light on long-term value of emergency oil arteries that helped to beat submarine menace by supplying war industries in eastern area

Many Early "Bugs"

During the period February 1943, to August 1943, the Big-Inch line had been in operation as far as Norris City, for about six months, and a total of approximately 70,000,000 barrels of crude oil was transported to either Norris City, which eventually reached the East Coast by railroad tank cars, or Marcus Hook and/or New Jersey. This operation was not at a very good load factor and consisted of numerous "ups and downs" and variations in the way of capacities. The equipment had to be tested under full-load operating conditions and numerous "bugs" existed which prevented satisfactory operation. In August 1943, the Big-Inch line was placed in operation to the East Coast, and again the capacities varied a great deal from day to day, and its deliveries to the coast were not 100 percent. However, since January 1944, there is a record of what can be termed full capacity or full-time operation and, from these data, certain information, as to expected efficiencies and performance of the Big-Inch pipe lines, can be determined.

During the first eight months of 1944 the 27 pump stations, having installed 122,000 horsepower, consumed a total of 489,000,000 kilowatt hours, for which the power utilities received $3,415,000, which resulted in a net cost per kilowatt hour of .697 cents, or about 7 mills per kilo-

watt hour. The demand on the power utilities' system varied from a low of 92,000 killowatts in the cooler months of January and February, to a maximum of 98,700 killowatts during the warm month of July. The average monthly load factors during the eight-month period varied from 85 percent to 93 percent, with an over-all average weighted load factor for the eight-month period of 85 percent. While the load factors may show something less than 100 percent, yet, the actual running time was 24 hours daily throughout this entire period. The variations in monthly load factors for each month, while we consider the running time at 100 percent or 720 hours a month continuously, yet, when one considers the type of oil which was being pumped through the line, varying from East Texas crude, with a viscosity of 50 Saybolt seconds at 70° F. and West Texas crudes with viscosities of 100 to 120 Saybolt seconds at 70° F., it can easily be understood why such variations in monthly load factors occur. This situation is of common occurrence. For 10 days a month, East Texas crude would be handled and then West Texas crudes would be pumped for the remaining 20 days, or vice-versa, or combinations of other types of oil and heating oil.

Another interesting disclosure from the operating data is that the daily average barrels pumped vary from 285,000 barrels per day during the colder months, or about 5 percent below designed capacity, to 314,000 barrels per day during the hotter months of July and August, which is about 5 percent above the designed capacity.

During the 8-month period, the Big-Inch line handled 72,400,000 barrels of oil from Longview, Texas, to the East Coast, requiring 489,000,000 kilowatt hours which amounts to a use of 6.75 kilowatt hours per barrel pumped through 1254 miles of pipe line, and the power costs for such total operation are 4.75 cents per barrel. About 1 percent to 2 percent of the oil started at Longview is delivered only as far as Norris City, or about 3000 to 7000 barrels per day. This means that Stations 1 to 10 pump at slightly increased capacities over Stations 11 to 26. In making original calculations it was estimated that these power costs would approximate 4.85 cents per barrel for pumping the entire distance. This slightly lower pumping cost was achieved by being able to make contracts for the power supply at four of the pumping stations—two in Eastern Ohio and two in Western Pennsylvania where the average rate for electric energy approached 5 mills per kilowatt hour at the high load factor contemplated and actually achieved. The apparent low rate at these four stations was unexpected at the time of the original survey.

Now, by selecting from the operating data certain months' performance—and again this has to be done by using average conditions—it can be ascertained that the motor efficiency is about 94 percent and the pump efficiency 86 percent, or an over-all efficiency of 80 percent by allowing for 1 percent losses in the transforming equipment. In terms of pressure drop per mile for the 24-inch pipe and average viscosities, this equals about 14 pounds per mile. These efficiencies met design estimates.

Daily Average 300,000 Barrels

In reviewing the actual operating data, it may be said that under reasonable

Welded and blocked up on skids preparatory to being cleaned, coated and wrapped, the Big-Inch pipe served transportation even before being charged with oil, as the smooth pipe was often the best path over the rough terrain. The extra height over the blocking at the top of the rise affords slack for longitudinal shifting under temperature changes.

conditions the Big-Inch line will handle 108,000,000 barrels of crude oil annually; which is another way of saying that the daily average of 300,000 barrels per day, the designed capacity, can readily be achieved. Also, that the power costs for pumping the entire distance from Longview, Texas, to Elizabeth, New Jersey, during much of the year, will closely approximate $5,000,000. The economy of this type of operation would result in a total pumping cost, when consideration is given to labor, depreciation, taxes, income taxes, and maintenance, of about 15 cents per barrel. Should the capacity factor of the line be decreased to about 83 percent and requiring two motor operations in each pump station, the power costs would not vary greatly from that shown above for full capacity operation in terms of cents per barrel, but with the fixed and operating costs remaining constant, the unit costs per barrel at such decreased capacity might approach 20 cents per barrel delivered to the East Coast.

In connection with the Big-Inch line, certain changes have occurred in pump station operation, brought about by flood conditions at the Mississippi river crossing. In laying out the stations originally, a location was spotted near Cape Girardeau as Station 9, but the power available from the utility would permit only one motor capacity of 1200 kilowatts. It was then decided to spot a two-motor station just east of the river known as 9-B. The one-motor station pumped one third the conventional distance between stations, or 18 miles, and the two-motor station pumped two thirds, or about 36 miles. All went well until the flood of May 1943, when the station 9-B was flooded out and the machinery had to be out of operation about 30 days while being dried out. This happened again in May 1944, and then the two motors were moved back west 20 miles across the river, making 9-A a 3-motored station. Sufficient power was available at Cape Girardeau since a 110-kilowatt power line had been constructed from Station 8 on the Arkansas-Missouri state line, to serve 3750 horsepower on the 20-inch products line in April 1943, about the time the Little Big-Inch line construction started. So now, all stations on the Big-Inch are standard 3-motored stations.

Little Big-Inch Operations

The 20-inch products pipe line (Little Big-Inch), due to trouble with the pipe, has been able to deliver to the East Coast about 25,000,000 barrels for the 5-month period between March 5 and August 1, 1944. This is at the rate of 180,000 barrels per day as against an original designed capacity of 235,000 barrels per day. Lower initial pressures at the pump stations are necessary which requires that only two 1250 horsepower motors be operated in each of the Little Big-Inch line pump stations. The motors in these stations are 3600 revolutions per minute and the efficiencies of the motors are about 93 percent; whereas, the efficiencies of the pumps are about 81 percent, resulting in a lower over-all efficiency of the Little Big-Inch line pump stations of about 75 percent, or 5 points lower than the Big-Inch pump stations. Deliveries of the products line have been rather erratic and subject to a great deal of variation, and, for this reason, it is not possible here to give more detailed information regarding its operating efficiencies and characteristics.

From the electric power standpoint, both the Big-Inch and Little Big-Inch lines are more or less joined together. To serve the 27 pump houses on the Big-Inch line and the 30 pump houses on the Little Big-Inch, there were 23 locations included where the power delivery was made through one power line to serve pump houses of both lines. A total of 415 miles of power lines had to be installed, of which 57 percent were of the 110-kilowatt, 32 percent of 66-kilowatt, 8 percent of 33-kilowatt and 3 percent of 22 kilowatt. The Defense Plants Corporation owns 170 miles or 41 percent of the power lines. This agency also made advances covering 158 miles or 38 percent of the total power line mileage as a prepayment since certain of the stations these lines served would not justify the power companies' making such long extensions based on the revenues they could receive. These prepayments involved stations in Louisiana, on the Little Big-Inch line. All of the power lines serving the stations from Norris City, Illinois, to the East Coast were constructed by the power utilities, amounting to 86 miles to serve 16 stations, and such construction was performed on a revenue basis by the power utilities.

Cost of Electric Facilities

The approximate cost of all electric facilities, including power lines, transformers, substations, motors, switchgear, and miscellaneous oil circuit breakers, lightning arresters, and motor-operated valves, totalled $6,885,000. Thus, with the total electric installation costs for all equipment approximating $7,000,000 to supply 232,000 horsepower for the Big-Inch and Little Big-Inch lines, cost per horsepower is $29.50 for procurement and making available to perform work. By leaving out the cost of the power lines, the cost of the electric equipment, including the motors all ready to run, is $19.50 per horsepower installed.

All the oil dispatching is handled by a special telephone system worked out by the Bell Telephone Company. Originally, the oil dispatching was done over leased lines of the Bell Telephone Company with teletype. The company uses a 4-wire phantom service conntction utilizing wires originally installed in its trunk system from Newark, New Jersey, to St. Louis, with overhead toll lines from the principal points of Philadelphia, Pittsburgh, Columbus, Indianapolis, Louisville and St. Louis, to smaller towns located near each pump station. From St. Louis south to Houston, the Bell overhead trunk lines are used for this same purpose with a lateral to smaller cities located near the pump stations. Thus, a total of 4200 miles of buried cable and overhead trunk lines is in use to serve the 33 pump station locations and a total of 68 telephones. Each product (20-inch) pump line house is operated seperately from the crude (24-inch) line pump house. This telephone dispatching system enables the sub-chief in Cincinnati for the crude line to talk to each operator of his 27 stations and another sub-chief dispatcher in Cincinnati to talk to each of his 30 products line pump houses. This system of telephone dispatching enables the dispatcher in Cincinnati to obtain instantaneous reports on pressures, on both suction and discharge, number of pumps in operation, and tank gauges. The telephones at each pump house are placed in a separate compartment to avoid noises in the station from conflicting with conversations. Also installed are loud speakers of special explosion-proof type, located near the discharge gate valve near each pump so that the operators can listen to reports from the dispatcher or other pump stafions while operating the valves or switch-gear to start and stop the motors.

Ultimate Use

Many factors must be taken into consideration when discussing the ultimate ownership and use of the Big-Inch pipe line. The line, in my estimation, is too large for any one operating oil company to own, therefore, it, no doubt, has to be jointly owned by four or five companies to obtain enough oil to justify its continuous operation at somewhere near capacity. Then again, some consideration should be given to such four or five operating oil companies being able to purchase this line intact at its depreciated value after the war for somewhere around $60,000,000. Its cost has now been established at about $75,000,000.

To what use will the Big-Inch and Little Big-Inch lines be put after the war? There has been considerable discussion and speculation about this question. Some are of the opinion that the lines may be used for natural gas transmission, but this would involve a great deal of changing around, requiring additional expense for compressor stations, and when one considers the costs of transmission at relatively high load factors and using a base price of 5 cents per 1000 cubic feet for the natural gas, this would result in a delivery price at a point in West Virginia or Ohio of about 20 cents per 1000 cubic feet. In terms of coal, on a British thermal unit basis, the gas cost would equal from $5 to $6 per equivalent ton of coal. Thus, for industrial uses, it would appear that natural gas could not meet coal competition if pumped through either of these lines from the Gulf Coast to a point in Ohio or West Virginia.

Industrial leaders and officials in the southwestern states are considerably alarmed at the prospect of moving natural gas in large quantities from their territory to the industrial centers of the East and feel that such a course would deplete reserves to a point where the natural gas industry of the southwest would be faced with ruin. This situation may have a benigh influence on the use of either of these pipe lines for gas transmission.

It is the writer's guess that the Big-Inch line will continue to be used for pumping crude oil and products for a long time in the future. This would necessitate the use of the Little Big-Inch line from the refining centers in Houston and Beaumont for products to be pumped through that portion of the line to Little Rock, Arkansas, where it would join with the crude oil line. The 20-inch line from Little Rock to the East Coast then could be abandoned or tied in with a gas transmission system. This arrangement would insure the 4 or 5 or 6 large oil companies having large crude reserves and large refining capacities, the ability to deliver crude and products to the East Coast through the 24-inch line at a reasonable cost in competition with oil tankers.

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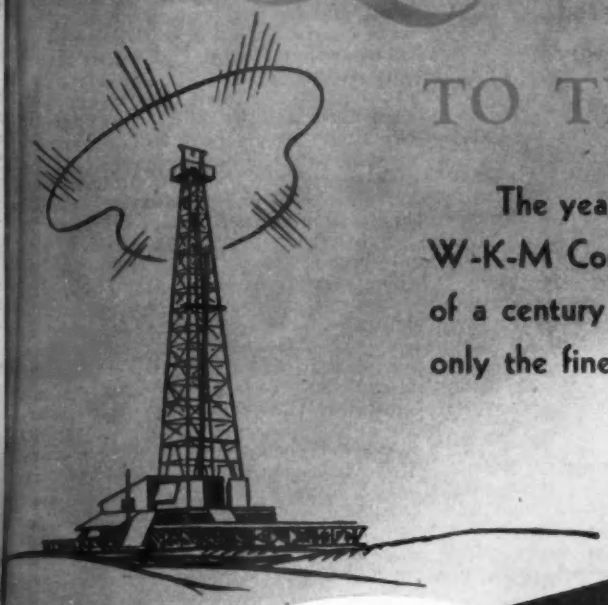

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Gas Drive Mechanism In Secondary Recovery

Information heretofore lacking on some phases of the use of gas to impart energy into a depleted formation given. Other experiments are under way

By R. J. DAY and S. T. YUSTER*
Division of Petroleum and Natural Gas, School of Mineral Industries
The Pennsylvania State College

THE problems confronting the oil man in his efforts toward continued production of the petroleum, upon which the present age has so largely come to depend, become increasingly acute as more and more of this much sought after substance is consumed. After flush production and flowing have ceased, where these problems were more or less taken care of by natural forces, energy in some form or other must be supplied for the further extraction of the large amount of oil still remaining in the earth.

One of the methods in use at present is to impart this needed energy to a gas through compression and then to pump this energy laden gas into the oil containing horizons where some of this energy is released and transferred to the oil. It works, but how does it work? And, how well does it work? When these questions are answered, then it may be possible to find ways of improving the process. It is hoped that the discussion to follow will shed at least a ray of light on the problem and perhaps stimulate a discussion that might bring other facts to light.

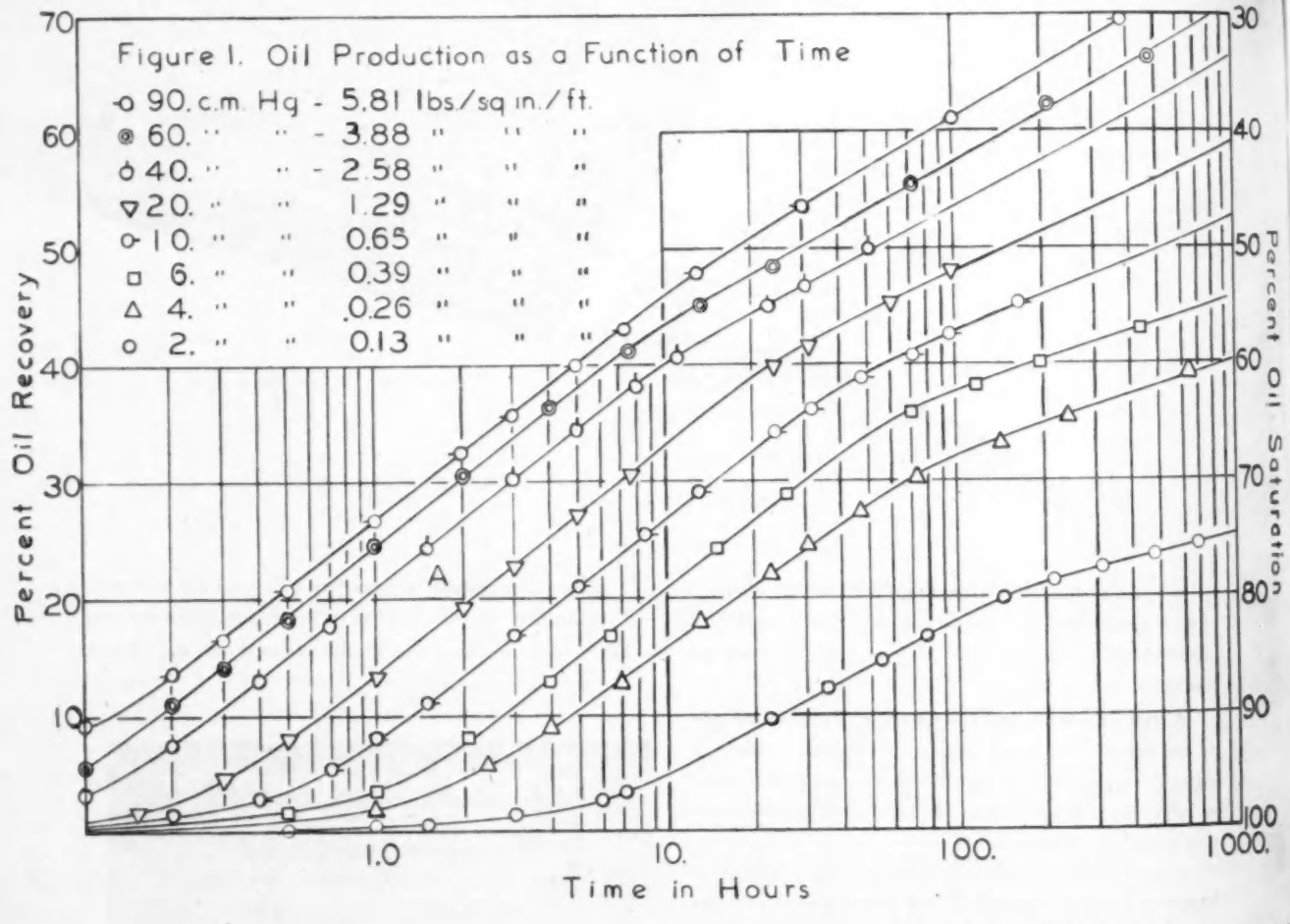
The experiments, upon which this paper is based, were conducted with the use of long (three feet or longer), horizontally drilled, consolidated cores. These were used in preference to the smaller cylindrical cores because pressure gradients of field magnitude could be impressed across these long cores which would almost be impossible to maintain across the smaller cores with any degree of accuracy. Moreover, it is easier to follow the various phases of production with the longer cores.

Treatment of Cores

After thorough extraction with solvents and having been dried, the cores were coated with a special coating that is impervious to oil and water until it was strong enough to withstand the pressure to be used. The cores were then saturated by filling the chamber, containing the thoroughly evacuated core, with oil. The oils used were special, low vapor pressure cuts of Pennsylvania oil having a gravity and viscosity approximating that of crude oil. In this way evaporation losses were minimized. After each experiment the cores, containing their residual oil, were evacuated in the chamber again and resaturated. The cores were weighed on a special balance having a sensitivity of 0.1 gram in order to obtain the saturation. With the exception of the first saturation the amounts of oil saturating the cores each time varied less than one percent. Hence, for this reason a saturation of approximately 100 percent has been assumed.

Although experiments involving both oil and water as the original contents have been started, they have not reached the point, as yet, where any report could be made. Therefore, the discussion will be confined to those experiments in which oil alone was the saturating medium.

Figure 1 is a semi-log plot of percent



* This paper was presented at the eighth technical conference on petroleum production held at the School of Mineral Industries, The Pennsylvania State College, State College, Pennsylvania, on October 27, 28, 1944.

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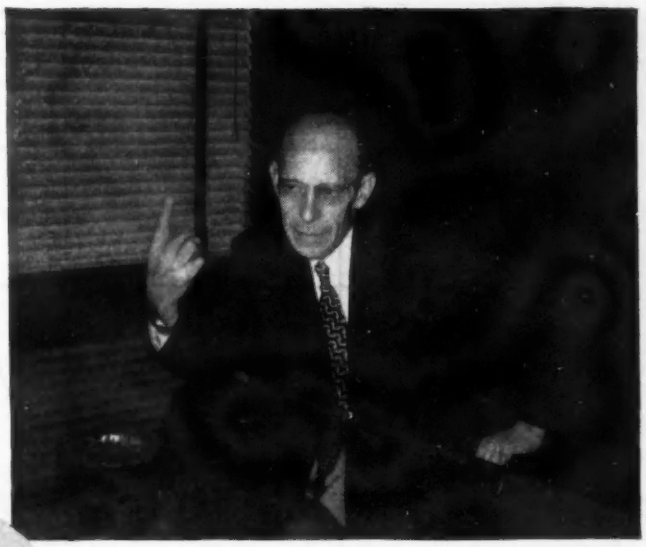

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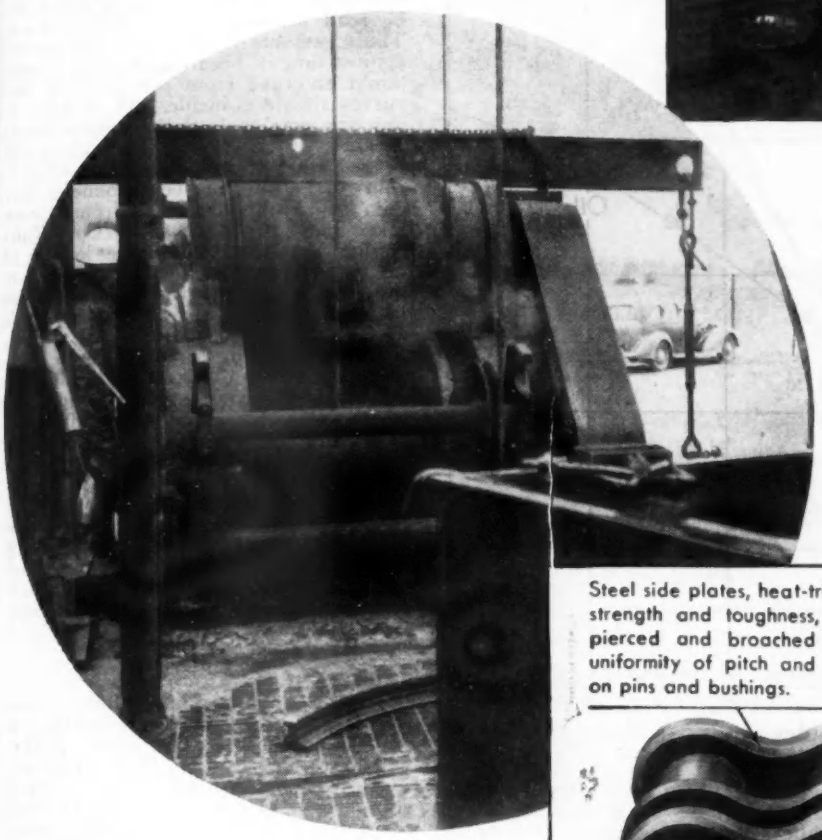

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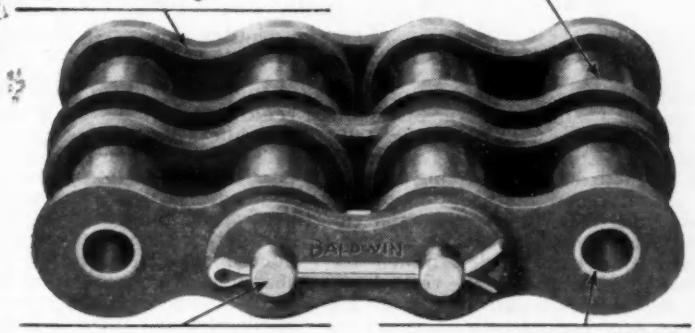

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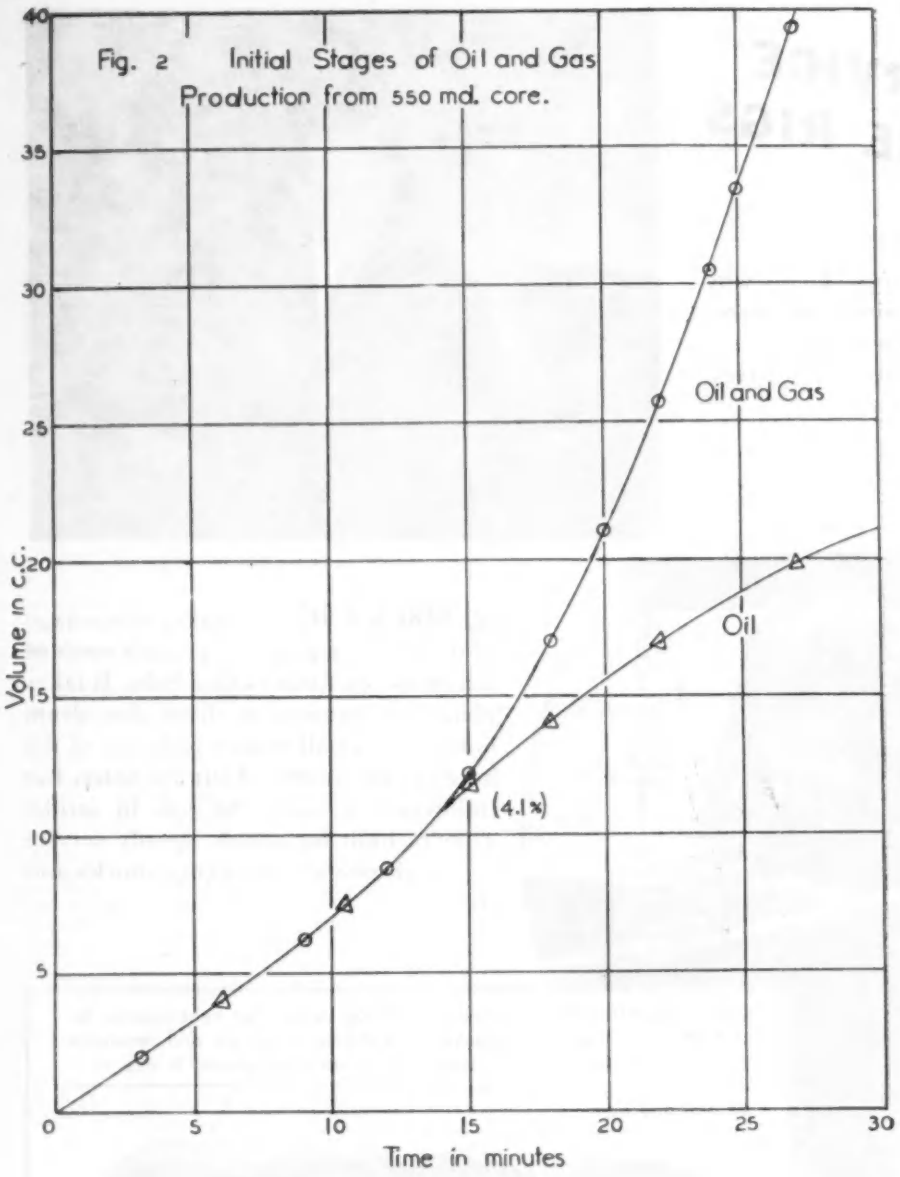

oil production as a function of time from an 800 millidarcy core. Since the cores being dealt with are practically 100 percent saturated, no great error would be incurred by assuming the average saturation of the cores to be the difference between 100 percent and the percentage oil production. This percentage saturation can be determined for any time by referring to the right hand side of the plot. A logarithmic scale for the time axis was chosen in order to give a convenient distribution of the data for analysis and to aid in the evaluation of the mechanism of oil production. As would be expected the production rate increased with increased gradients, being the most sensitive to changes in gradient in the low gradient region. It will be noted that there are two linear portions to each curve separated by a change in slope indicating a possible change in the mechanism of oil production. This change in slope appears to occur at fairly well spaced intervals with regard to percent oil production. The first portion of the curves shown in Figure 1 represent the penetration of a gas into a completely oil filled sand and there is a short interval in which there is an increase in the oil production rate. This corresponds to the displacement of the more viscous medium, oil, by the less viscous medium, gas. The place at which the curves entered the first linear portion "A" coincided with the place at which air began to break through at the production end. In every experiment this had occurred by the time 10 percent, or even less, of the oil had been expelled from the core.

These points of air break-through were estimated from a comparison of the rates of air flow and oil production. Recently, a more accurate method of determining this point of air break-through was deveolped. A gas burette was connected to the outlet of the liquid trap which was in turn connected to the outlet end of the core. In this way the liquid produced from the core was measured in the liquid trap and the combined volume of liquid and gas emerging from the core was measured by the gas burette both of which could be read to within 0.1 to 0.2 of a c.c. These two sets of data were then plotted against time in Figure 2. As long as only liquid emerged from the core the two curves should coincide. But, as soon as any gas was evolved the curves would diverge. In Figure 2, the curves diverged when about 11. c.c., or 4.1 percent of the oil had been produced. The data for Figure 2 comes from a core taken from the same sand (Cow Run) having practically the same length (3 feet) and a fairly similar permeability as the core from which the data for Figure 1 was obtained. Furthermore, this method applied to a longer core (4 feet, 4 inches), having a much lower permeability (40. millidarcies) also showed an air break-through when 4.0 percent of the oil had been produced. This behavior agrees well with that observed visually. That is, the driving gas very rapidly fingers through the most accessable channels thereby by-passing large oil containing areas. This would further indicate that there would be very little, if any, semblance of a flood front, as generally pictured in gas drive. If any flood front should exist it must be very diffuse.

Fun Begins

This behavior is quite different from that encountered in water-flooding in which a large percentage of the oil that will be produced is expelled before any of the driving medium appears. Upon comparison with water-flooding in this respect gas-drive, at first glance, would appear to be a process of low efficiency under these conditions. But, as is often the case, appearances are sometimes deceiving. Whereas in water-drive the appearance of the driving medium is an indication that the greater part of the oil has been driven out, this is by no means the case in gas-drive. The fun has just begun.

After the air had broken through, the recovery process began to obey the linear relationship illustrated in region "A" of the curves in Figure 1 which extends over an additional 15 to 35 percent oil production, the linearity extend-

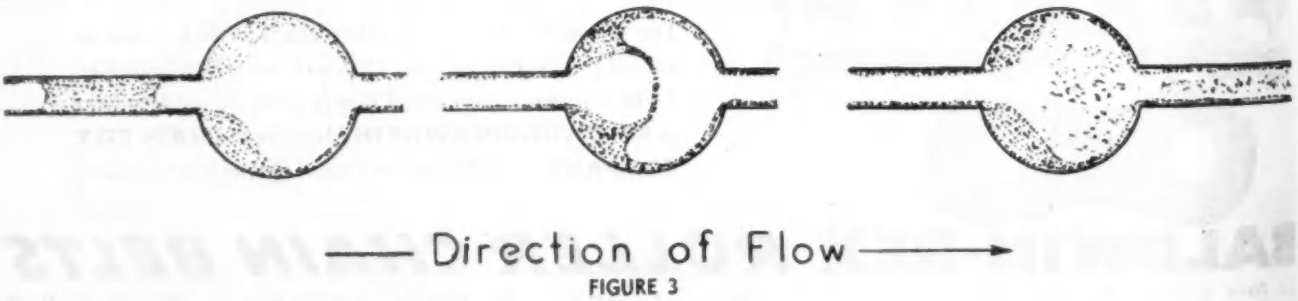

FIGURE 3

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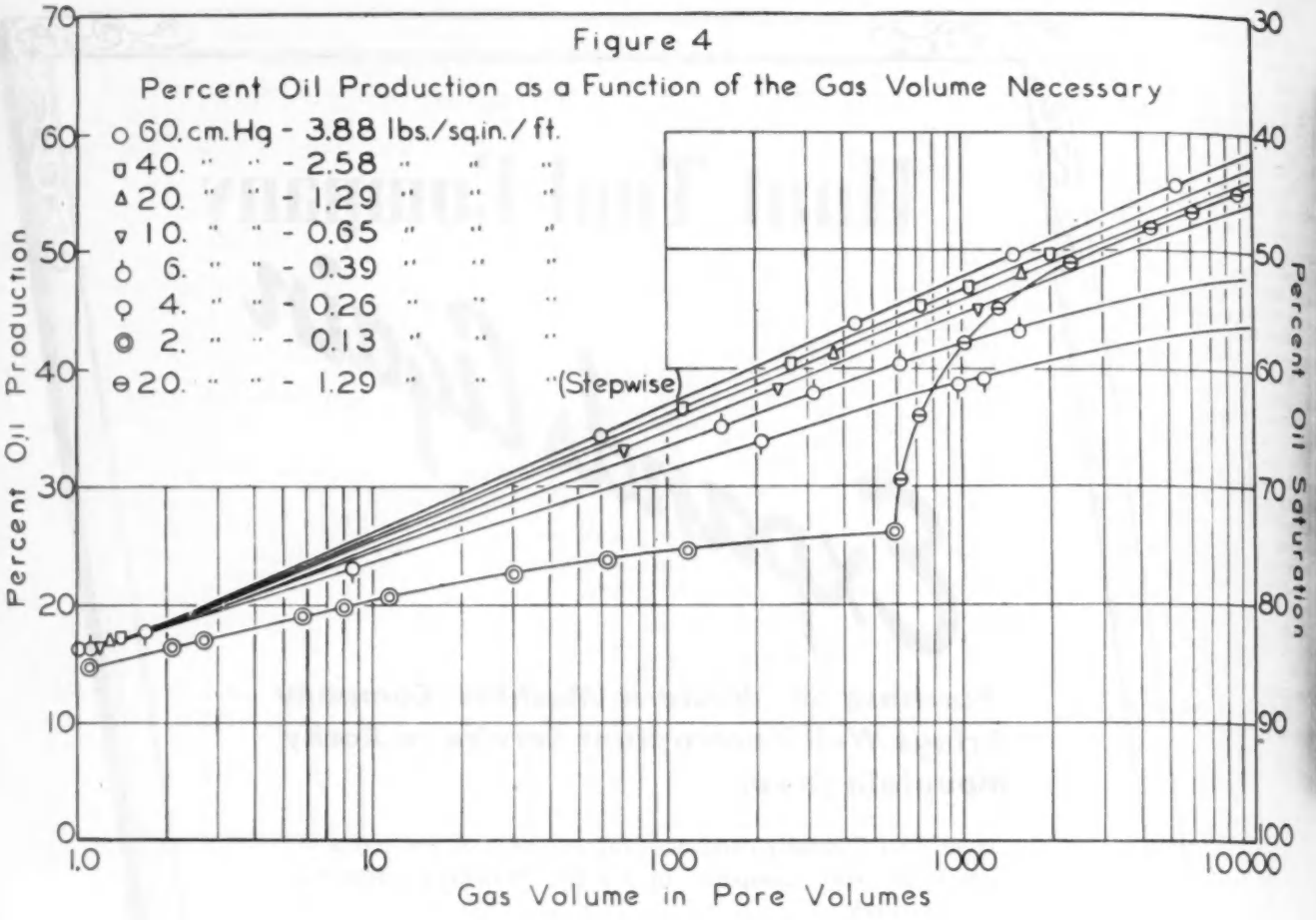
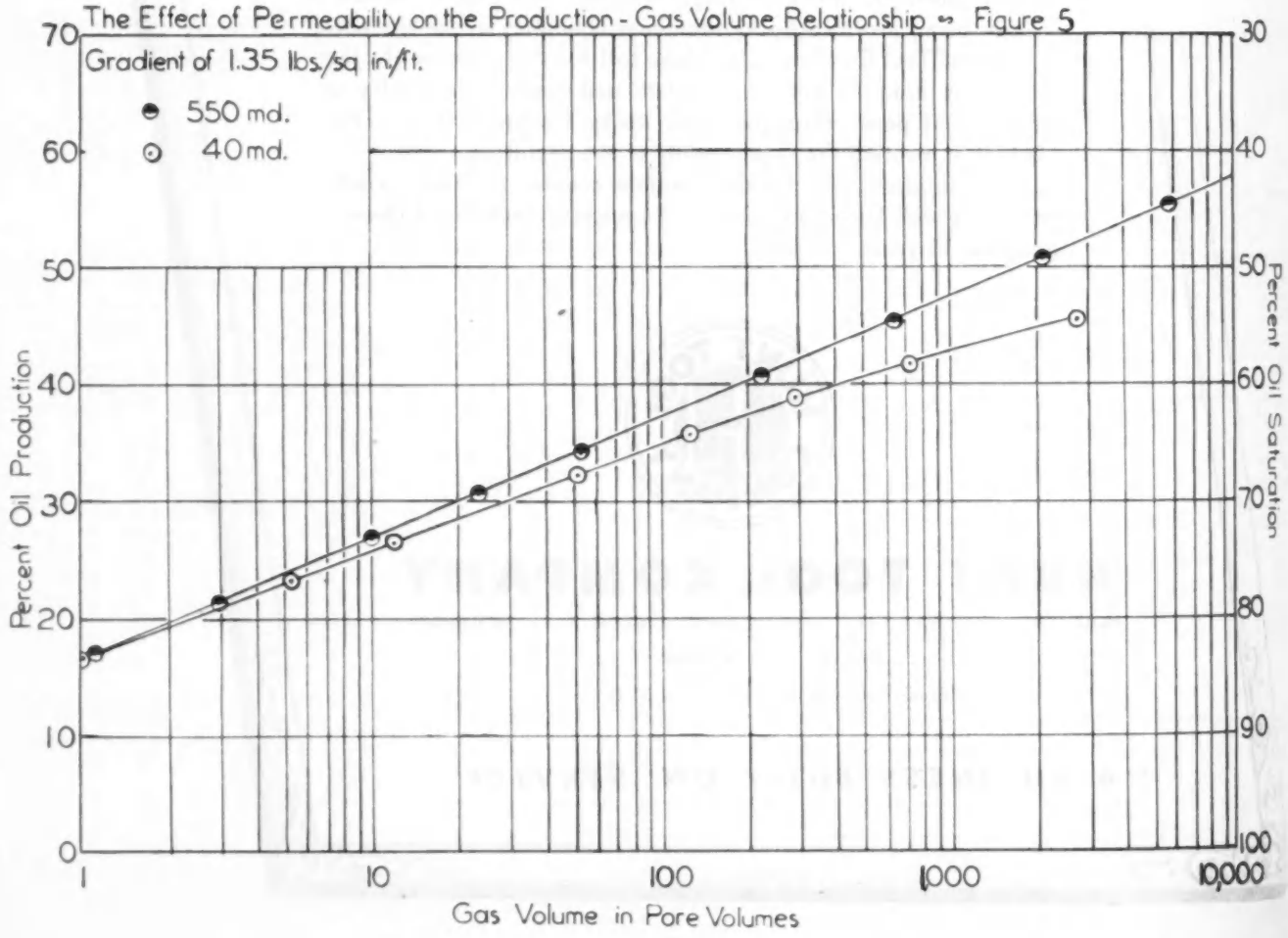
Figure 4

Percent Oil Production as a Function of the Gas Volume Necessary



The Effect of Permeability on the Production - Gas Volume Relationship — Figure 5



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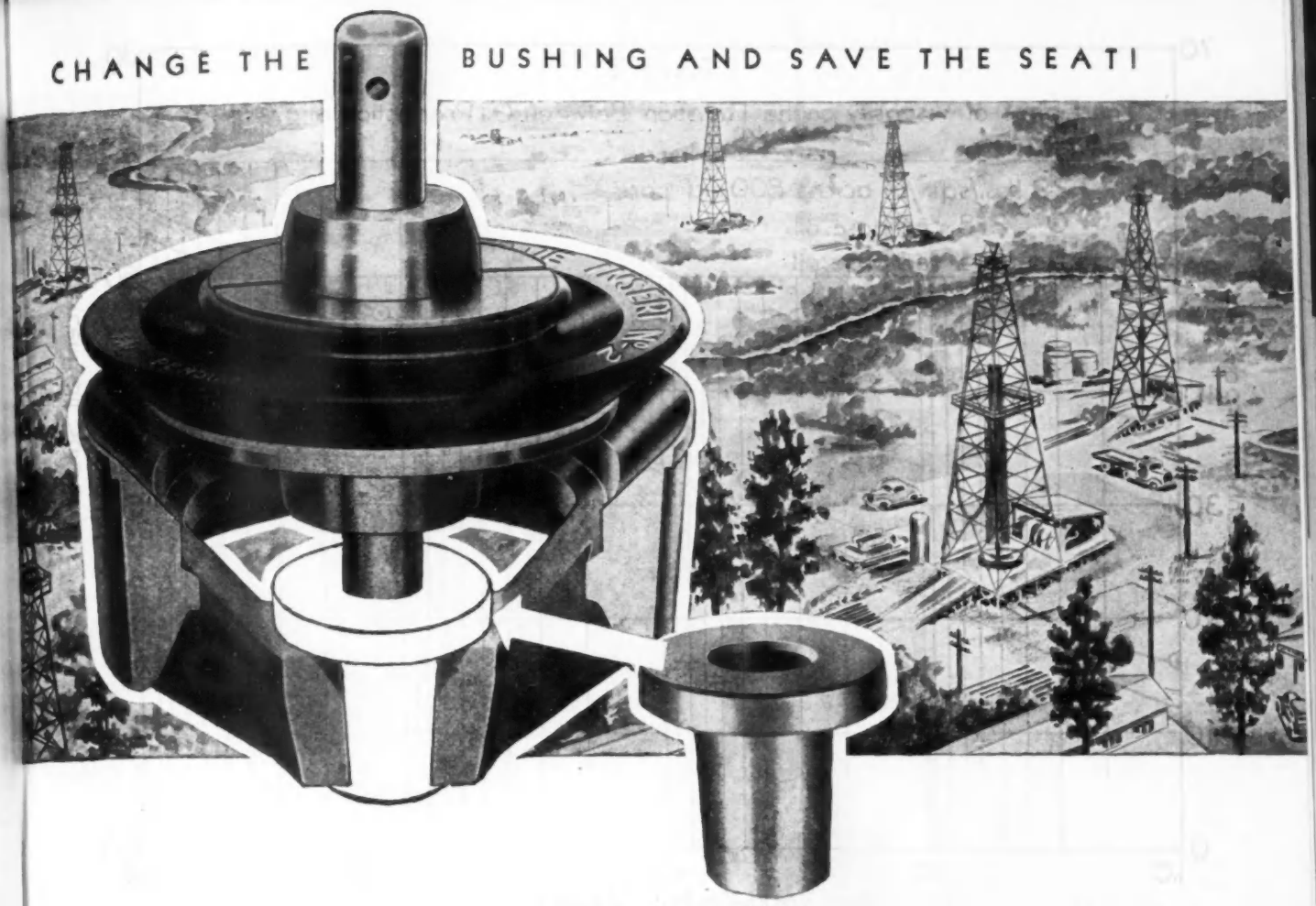

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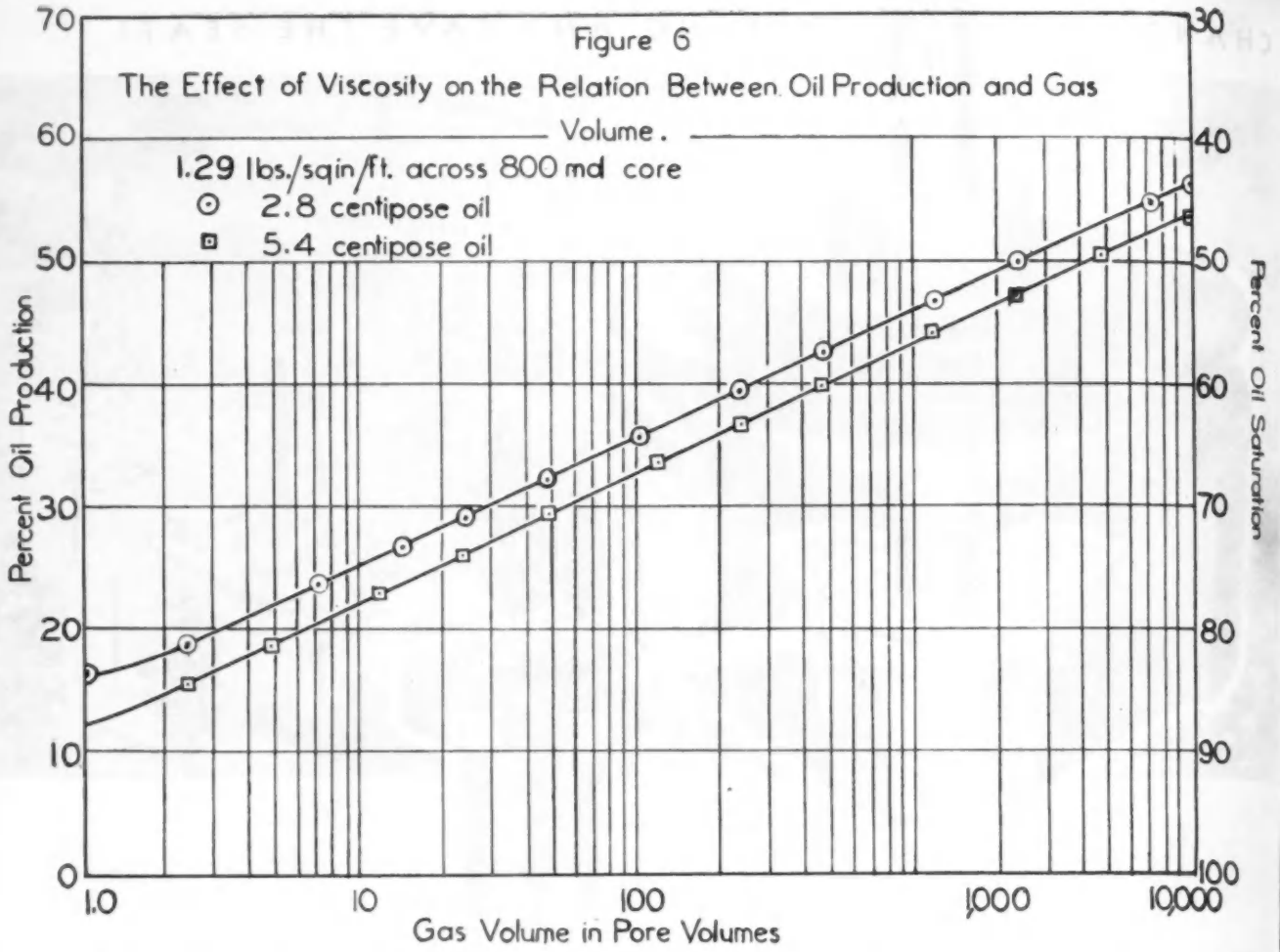

ing over a greater production range with increasing pressure gradient.

The curves in this linear portion appear to be parallel to one another for gradients of .39 pounds per square inch per foot and greater. In this range the increase in production rate is linear; that is, doubling the gradient halves the time required to produce a given amount of oil. However, since the rate is continuously decreasing, doubling the gradient will not necessarily result in doubling the recovery in the same length of time. The slope of the .26 pounds per square inch per foot curve is smaller than that of the higher gradient curves and the slope of the .13 pounds per square inch per foot curve is still smaller. This would indicate that a given increase in gradient in the lowest gradient region would result in a greatest increase in production rate.

It is during this period of linearity that the oil is moved through, or from, the more inaccessable and smaller channels possibly to the larger channels along with the oil remaining as a film on the surface of the larger channels and thence to the outlet. Judging from observations made with the aid of sand filled microscopic cells and very fine capillary tubes under the microscope, the movement of oil by means of gas drive is accomplished in a number of ways which in all probability occur more or less simultaneously. The primary piston drive of gas behind a column of oil is by no mean efficient. In contrast to water-flooding there is not the slightest doubt as to which is the wetting phase in these experiments, the fluid displaced being that phase in every case. Bearing this in mind, the advancing gas could not be expected to entirely remove the oil from the sand surface. Therefore, an appreciable quantity of oil is left behind in the form of a film on the surfaces of the channels already penetrated in addition to the oil still remaining in the smaller channels and crevices. Since the amount of surface for a given pore volume increases with decrease in the size of the capillaries, the percentage of oil left behind in the form of a film will increase with decrease in the size of the channels or permeability. A portion of this oil film is dragged along the channel in the direction of flow by the gas flowing through the channel, and it gradually grows in thickness.

Figure 3 is a highly idealized illustration of this phenomenon. The growing oil film eventually becomes thick enough or enters a constriction where it may bridge the chennel and from there on is propelled by the air stream as a segment, or slug, of liquid. It has been further observed that when these slugs enter a wider portion of the channel the oil segment spreads out so that sometimes its film thickness becomes thin enough to be ruptured by the gas stream. When this occurs part of the bursting oil film is broken into tiny oil droplets which are carried on by the gas stream, while the remainder of the oil lodges in the enlarged pocket until more oil can be dragged up to it to form another segment of oil.

Now these tiny droplets, which form a fog-like dispersion, probably carry an electrical charge, thus making their precipitation in the sand more difficult. This would tend to cause the particles of suspended oil to be carried through the sand in the gas stream toward the producing well until they are subsequently precipitated somewhere further on in the formation. Since these channels are continually changing in size and shape, being made up of the voids and crevices between the sand grains and the cementing materials, this process of fog formation and precipitation should be repeated a very large number of tmies during transit of the oil through the formation. This behavior was observed for both the close cut oils, usually used in these experiments, and with crude oil. Meanwhile, of course, evaporation and entrainment of the more volatile constituents are continually taking place.

Referring again to Figure 1, the flat portions curving up into region "A" correspond to a so-called piston displacement of oil by gas from the larger pores. Region "A" itself consists of the removal of oil from smaller and smaller pores (through which movement is slower) coupled with the dragging effect of the gas stream on the oil film left behind by the first piston action. Eventually, region "A" changes to another form in which vaporization and entrainment play the dominant role, the greater majority of the pores from which it is possible to remove oil at that pressure having been cleared of all but a film of oil. The relative extent of these different phases will differ, of course, from strata to strata depending upon the pore size distribution. Increased pressure gradients, however, would expell slightly more oil from

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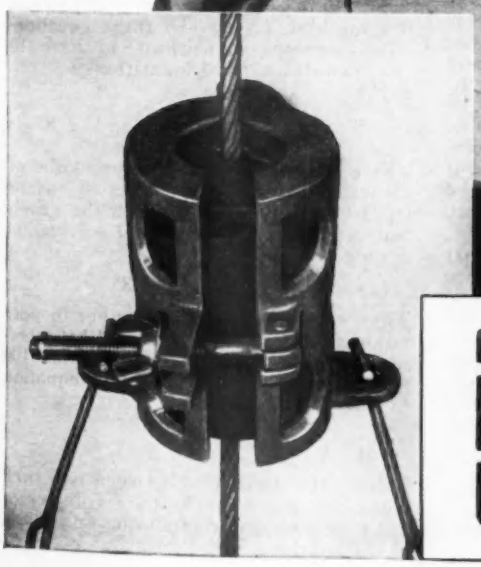

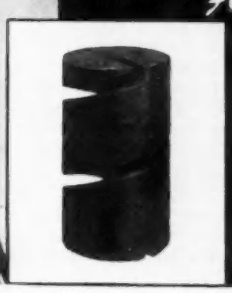

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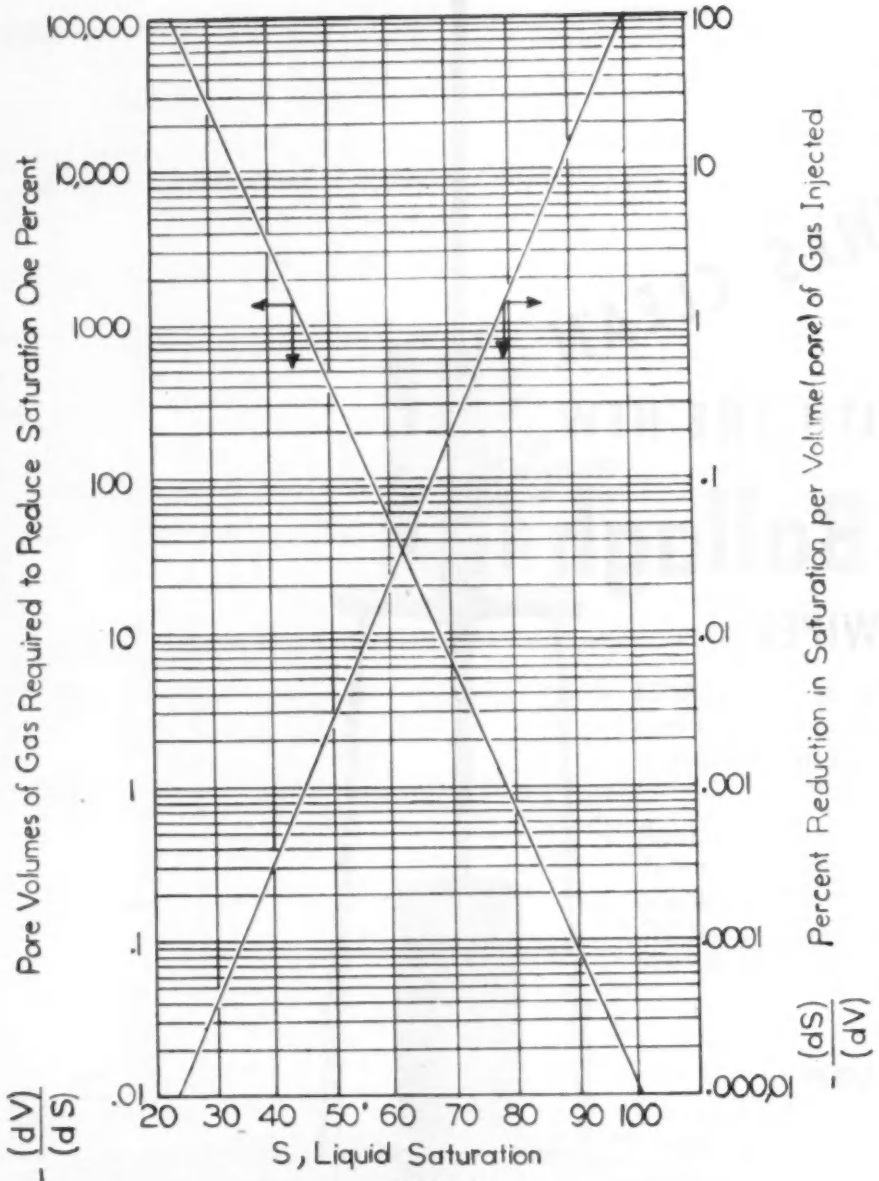

FIGURE 7

more of the smaller pores, and the increased rate of gas flow due to the increased pressure gradient would doubtless leave behind a thinner residual film of oil. In addition it has also been observed that increased gradients, which result in increased flow velocities, bring about larger quantities of entrained oil mist. As was pointed out previously the production rate increases in proportion to increase in gradient for most of the gradients in region "A." Above this region the relation is even more favorable to the higher gradients, a two-fold increase in gradient reducing the time to recover a given percentage of oil to less than half.

The recovery process is relatively inefficient for very low gradients, the efficiency becoming increasingly worse with decrease in gradient as illustrated by the .13 and .26 pounds per square inch per foot gradient curves. Not considering the time factor, there seems to be a maximum gradient, above which the extra returns gained are not large enough to justify an increased energy injut. This may be seen in a different way by referring to Figure 4. This plot of production versus the volumes of gas required gives some idea of what can be expected from a given volume of gas injected at different pressures. For gradients greater than 0.65 pound per square inch per foot the difference in the yields for increases in gradient become small. This may also be seen by observing that the slopes of the lines in Figure 4, approach one another in the region of higher gradients. A measure of efficiency of the various gradients may be obtained by comparison of the slopes of the lines and the points of deviation from linearity. The lower the gradient the smaller the slope and the lower the percentage recovery at which divergence from linearity occurs.

In answer to the question as to what would occur upon increasing pressure gradients stepwise, an experiment in which the gradient was increased from 0.13 to 1.3 pounds per square inch per foot following some production at the lower pressure was performed with the result shown in Figure 4. A substantial increase in recovery was obtained, the production gas volume relationship swinging up into the neighborhood of that obtained from an initial application of 1.3 pounds per square inch per foot on the thoroughly saturated core. However, the stepwise process never attained the efficiency of the high maintained pressure application by a factor of the order of magnitude of the difference in gas volumes used to produce oil up to the point at which the stepwise changeover was made. For instance, the changeover was made at 26 percent production at which time a difference of 590 pore volumes of gas had been pushed through the core to accomplish the same production with the two different gradients. Practically the same difference in gas volume existed at the close of the experiment although it is not apparent on the graph due to being drawn on a log scale. The small distance on the volume axis separating the two curves at 55 percent recovery corresponds to the same distance separating them at 26 percent recovery. Similar results were obtained from other cores. In fact, all the results reported so far, have also been duplicated with other cores. That is, the general behavior was the same, the difference being that of magnitude. From this it can be seen that the longer a process is maintained at a lower gradient the more gas is handled unnecessarily. However, it can be predicted that a sizeable increase in gradient should result in an increase in production but with the use of a larger quantity of gas depending upon the length of time that oil has been produced at the lower gradient.

Presumably it would not be amiss to touch briefly on the effects of permeability and viscosity on the oil production—gas volume relationship, which is about all that can be done at the present time. Figure 5 shows the effect of the same gradient on two cores; one having a permeability of 550 millidarcies and the other 40 millidarcies. The departure from linearity has already set in at 1000 pore volumes for the 40 millidarcies core but is not yet apparent at 10,000 pore volumes for the 550 millidarcies. These cores are from the Cow Run sand and the same oil has been used in both.

Figure 6 shows the effect of viscosity on this relationship. The same gradient was used on the same core and both oils were special low vapor pressure cuts of Pennsylvania oil, having viscosities of 2.8 and 5.4 centipoises. The slopes of the lines are approximately parallel and the ratio of the volumes of gas required is approximately that of the viscosities.

Equation Obtained

The equation for the supper curve in Figure 6 may be obtained by the following method. (Note—In these equations "log" denotes logarithms to base 10, "ln" denotes natural logarithms.)

(1)

$$S = \frac{S_2 - S_1}{\log V_2 - \log V_1} \log V + 85$$

where S_1, V_1 and S_2, V_2 represent the oil saturation and pore volumes of gas respectively for two points on the graph. Substituting these data and solving for S gives

(2) $S = -10.5 \log V + 85.$

This equation gives the number of pore volumes of gas, V, which will be necessary to change the saturation from 100 percent to S percent. Solving equation (2) for V

(3) $V = 10^{\frac{85-S}{10.5}}$

Taking the difference between two such equations will give the pore volumes of gas necessary to go from one saturation, S_1, to another, S_2.

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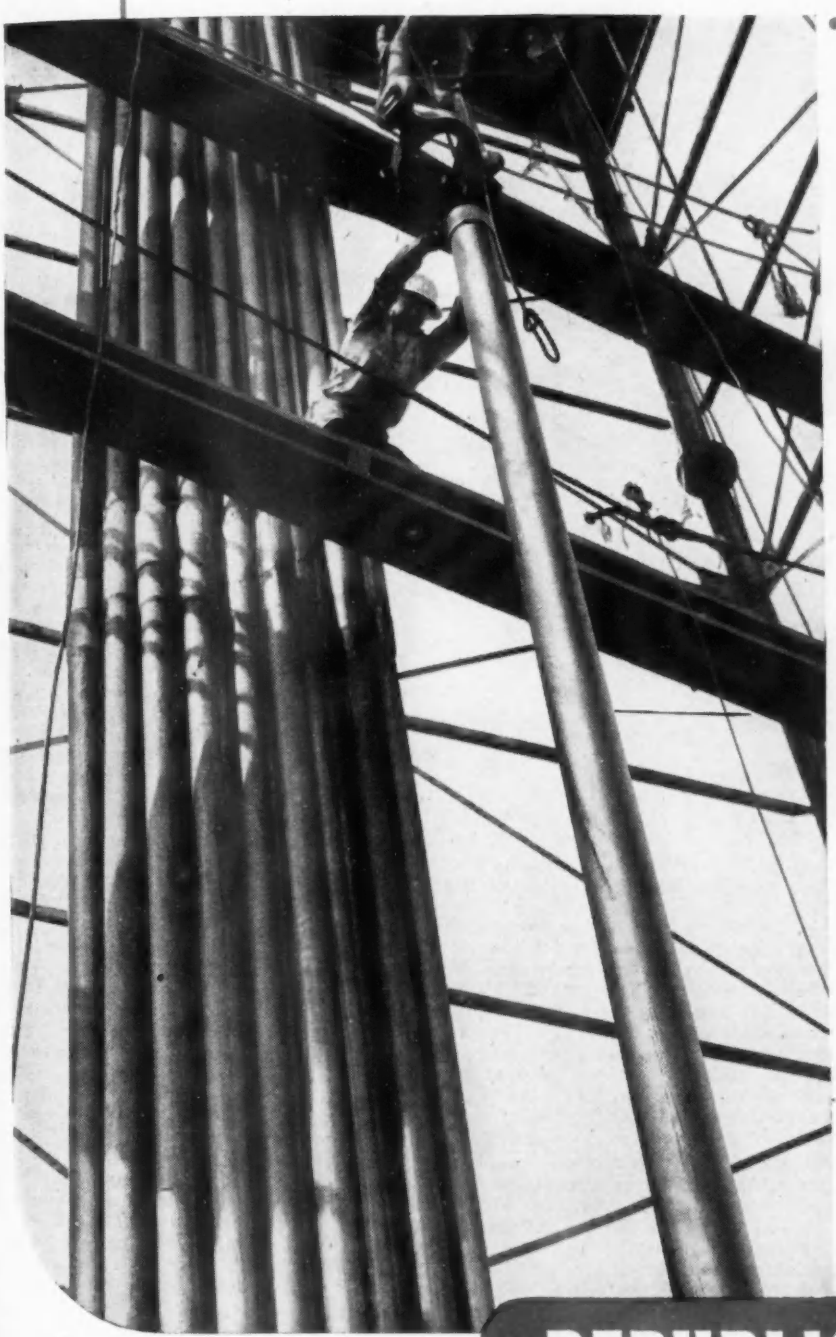

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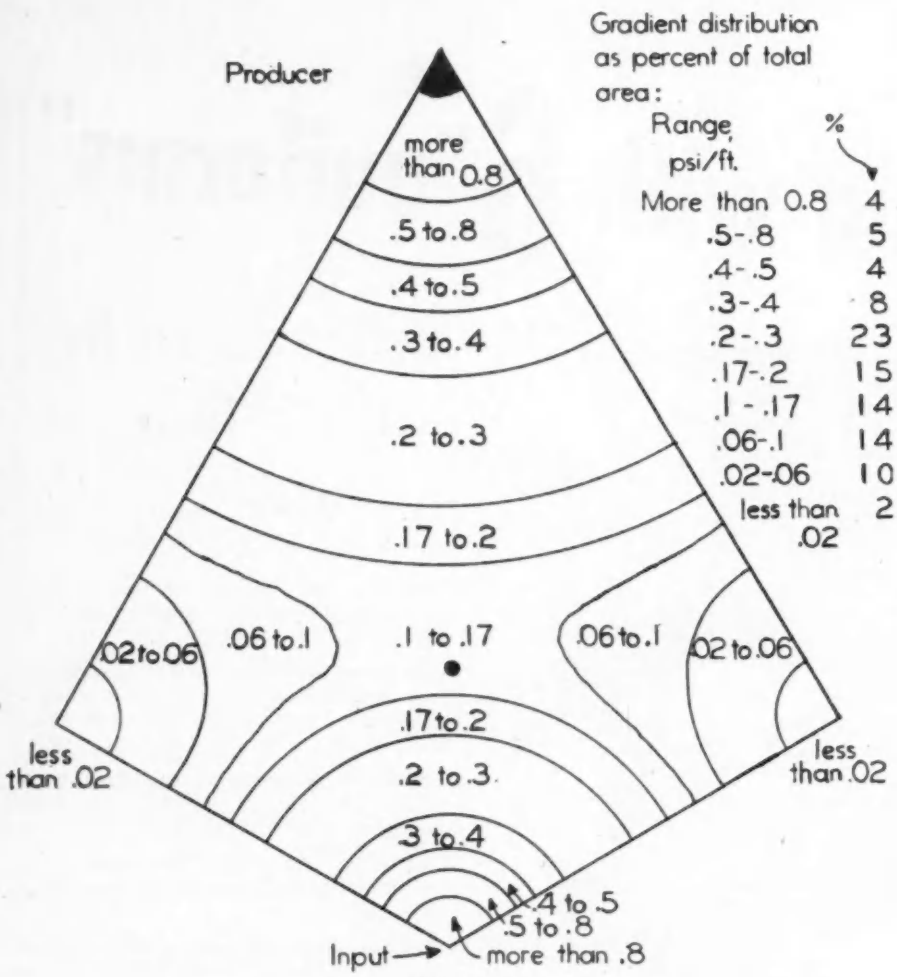


FIGURE 8

(4) $V = V_2 - V_1 = 10^{8.1}(10^{\frac{S_2}{10.8}} - 10^{\frac{S_1}{10.8}})$

If the final oil saturation is fixed at some economic limit, such as 25 percent, it will be possible to calculate the gas necessary to accomplish this if the initial oil and water saturations are known. If the final oil and water saturations are assumed to be 25 percent and 25 percent respectively, then S_2 is the sum of these quantities, or 50.

If the initial oil plus water saturations are S_1, then the quantity of gas necessary to produce the oil to the final saturations indicated will be

(5) $\Delta V = 10^{8.1}(10^{-4.76} - 10^{-.0962 S_1})$

In order to determine the number of pore volumes of gas necessary to change the saturation by one percent at different saturations, or conversely, the change in saturation resulting from the injection of one pore volume of gas, it will be necessary to change equation (2) to natural logarithms and differentia to

(6) $S = -4.559 \ln V + 85$

Differentiating gives

(7) $-\frac{dS}{dV} = \frac{4.559}{V}$

and

(8) $\log\left(-\frac{dS}{dV}\right) = \log 4.559 - \log V$

Solving equation (2) for log V, substituting in equation (8) and simplifying gives

(9) $\log\left(-\frac{dS}{dV}\right) = .0952\,S - 7.437$

and

(10) $\log\left(-\frac{dV}{dS}\right) = -.0952\,S + 7.437$

The expression obtained gives either the change in saturation brought about by the injection of one pore volume of gas or the number of pore volumes of gas necessary to change the saturation by one percent at any given saturation. The relationship obtained is essentially the gas-oil ratio multiplied by a constant and is plotted in Figure 7. The graph indicates that ten times as much gas is required to produce a given amount of oil from a saturation of 50 percent than is necessary to produce the same amount of oil from a saturation of 60 percent.

It might at first appear that some of the gradients listed in Figure 1, which were those used in this work, are lower than those used in the field. That this is not strictly true may be seen after a study of Figure 8, which is a reproduction of calculations made by R. F. Nielsen of the Division of Petroleum and Natural Gas. This figure shows the calculated pressure gradient distribution in a segment of a seven-spot in which a uniform permeability to gas is assumed. The spacing is 200 feet and the injection pressure is 150 pounds per square inch. The effective well radii were assumed to be ¼ of a foot for the input and 10 feet for the shot producer, which conforms more or less with the general situation in the field. In the upper right hand corner of the plot is the result of a calculation of the percentage of the total area of the segment devoted to the various groups of pressure gradient ranges.

From this calculation it may be seen that about 26 percent of the area of the segment is under a smaller gradient than the lowest gradient used in these experiments, 0.13 pound per square inch per foot. Approximately half of the area is under gradients equal to or less than the second smallest gradient used; namely, 0.26 pound per square inch per foot. For this particular core a gradient of 0.65 pound per square inch per foot seems to be the upper limit beyond which the returns in production become rapidly smaller with increasing gradients. About 90 percent of the area of the segment is operating below this gradient. If the input pressure is doubled to 300 pounds per square inch, keeping everything else the same, it would not be too far in error to assume that the gradients in the various areas would increase proportionally. Now, 12 percent of the area is operating below the lowest gradient, 26 percent below the second smallest and 80 percent below the upper limit.

Conclusion

A brief summary of what has been found thus far is:

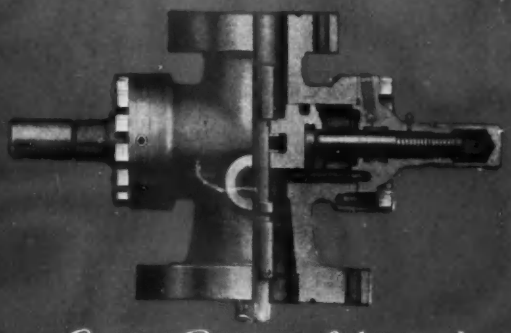
1. It has been found that the driving gas first appears at the producing end at very high oil saturations (approximately 95 percent), thus indicating, at best, a very diffuse flood front. This was followed by production of oil in the form of segments or slugs interspersed between bubbles of gas. Along with this and directly following, the oil is moved in the form of a film by the action of the gas stream, which subsequently leads to the formation of the oil fog. Accompanying the movement of air through the formation is the process of evaporation of the lighter ends and their entrainment in the gas stream. This increases as the volume of gas put through increases. Owing to the nature of the oil used in these experiments nothing could be said concerning the effect of a dissolved gas drive such as occurs in flush production. Even assuming that this had taken place initially the over-all picture just portrayed should not be changed to any great extent.

2 It has been shown that an increase in pressure gradient results in a greater ultimate recovery, a faster recovery, with the use of less gas.

3. A linear relationship seems to exist between the saturation and the logarithm of the gas volume necessary to reduce the saturation. It is thus possible to predict the volume of gas necessary to go from one saturation to another. It also appears that this relationship is dependent upon the pressure gradients employed, the permeability, and the viscosity. Numerous other factors will doubtless be found that will also effect the relationship as the subject is persued.

4. A greater ultimate recovery at a faster rate with the use of less gas is obtained from higher permeabilities.

5. Finally, the production rate is faster and less gas is necessary for the recovery of less viscous oils. In the range of viscosities found in Pennsylvania crude the volume of gas necessary for production, at any given saturation, is approximately proportional to the viscosity.



Cross Section View of

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Varied Pumping Problems In the Seminole Area

Small, medium and large volume wells all have their problems and selection of pumps to handle each must be done carefully. Heavy wells are most troublesome

By C. D. BORLAND, Gulf Oil Corporation, Tulsa

MANY pumping problems have arisen in the Seminole area of Oklahoma because of the characteristics and depths of the various producing zones. Most of the wells in this area, which includes oil fields in Seminole, Okfuskee, and Pottawatomie Counties, produce from such formations as the Cromwell Sand, Hunton Lime, Simpson Dolomite, and First or Second Wilcox Sand. These producing horizons are found at depths varying from 3400 to 4500 feet. In general, the wells may be divided into three groups, viz, small, medium, and large-volume wells. The wells producing small volumes of fluid occur chiefly in the Cromwell or other Pennsylvanian sands, while the medium and large-volume wells generally produce from the Hunton lime, Simpson Dolomite, or Wilcox sands. Of the three groups, the large-volume wells give the most trouble from a pumping standpoint.

Selection of producing equipment for use at such diverse wells is a never-ending problem. Seminole area wells are mostly produced with some type of bottom-hole, sucker-rod actuated pump. These sucker-rod insert type pumps are found in the following arrangements: 1. travelling plunger — top anchor; 2. travelling plunger—bottom anchor; and 3. travelling tube—bottom anchor. These three types are available with either a metallic or a non-metallic plunger.

Pump Selection

When selecting a pump, the ultimate goal is to get a pump of such type and bore that the well's production will be obtained with the least possible pump expense. Sometimes a cup-and-repack plunger pump is desirable whereas, at other times, a metallic plunger pump is required. Since the repair cost to a metal plunger pump is approximately three times the cost of repairs to a composition plunger pump of the same size, the service rendered by the metal plunger pump must correspond. Both metallic and non-metallic plunger pumps should be tried and their respective repair costs, relative volumes of fluid produced, and service periods compared.

Each individual well is a different problem. Tests show that there are wells in the Seminole area producing fluid volumes ranging from 1 barrel of oil and no water to an average maximum of 30 barrels of oil and 750 barrels of water daily. Such a wide variation in volume of fluid produced, therefore, requires small-bore, as well as large-bore, pumps. Insert pumps commonly used vary in bore size from 1 to 2.5 inches. The length of a pump used in a particular well is controlled by the amount of pump stroke allowed for valve spacing and the length of stroke required by the surface equipment. The 12 to 18 inches usually allowed for valve spacing plus a surface stroke of from 12 to 74 inches results in the employment of pumps ranging from 6 to 18 feet in length. All in all, there are many factors affecting pump selection. Complete pump expense including initial cost, labor and material charges for servicing, volume of production obtained and length of service rendered must be taken into account.

Pump Operation

Special pumping difficulties are encountered at small as well as at large-volume wells. Pumping difficulties at small-volume wells consist mainly of (1) limited fluid volumes, (2) gas, (3) paraffin, and (4) gyp. Problems arising from limited volumes of fluid occur at most small-volume wells. Fluid pounding, which often results from the natural tendency to pump the well off, is detrimental to both pump and sucker-rod service. Since most pumps are assembled by means of threaded joints, the jarring action caused by fluid pounding often results in a part of the pump unscrewing, which terminates the pump run. Pounding action also hastens failure of non-metallic plungers and pump valves because of the shock loading it creates. Fluid pounding can be minimized by employing the smallest bore pump that will satisfactorily produce the well while operating at slow speeds.

A pounding condition often is caused or is made more acute by the presence of gas. The low bottom-hole pressure existing in a small-volume well is conducive to the release of solution gas which, plus any free gas, can create a pumping problem. When this condition is severe, the pump may become completely gas-locked. However, presence of excessive gas generally results only in a pounding action. In addition to reducing the pump's efficiency, a gas pound is just as detrimental to the pump as a fluid pound. The gas problem can be partly or completely relieved by obtaining the greatest pump submergence possible and by using a small-bore pump operating at a slow cycle, or by the use of a gas anchor.

The subsurface pumping equipment at some small-volume wells in this area is contaminated with paraffin. This problem, not a serious one, generally can be solved by using a paraffin scraper. It is common practice to run such a device each time the pump is changed at those wells where paraffin is a problem. At some few wells the paraffin accumulation is so heavy that it is impossible to pull the pump when a pump replacement becomes necessary. When such a condition exists the only solution is to strip the rods and tubing and the tubing cleaned by steaming or burning. Small-volume wells of this type are usually light and easy-running, having relatively long pump and sucker-rod service. It is not impossible nor rare to have a Seminole small-volume paraffin well in operation from six months to a year without its needing service for either sucker-rod or pump failures. Consequently, there is sufficient time for a heavy deposit of paraffin to accumulate on the sucker rods and in the tubing and thus possibly cause a stripping job. Heavy paraffin accumulations can be eliminated or greatly reduced by systematically changing the pump. Where a 6- to 12-month pump run is normally obtained, the pump should be changed every 3 to 6 months or oftener. By experimenting and keeping records, the approximate maximum time interval when the pump can be changed without the necessity of pulling the tubing can be ascertained. Expense will be considerably less than if the pump is kept in service until failure occurs.

Gyp Problem

The gyp accumulation or deposit found in a few wells in the Seminole area does not constitute a major problem. Where present, it is usually found in the tubing, in the pump, and on the sucker-rod string. Cases are known where such a deposit has gradually reduced the opening through a tubing anchor or insert pump, thus affecting the well's normal production. A condition of this kind can be detected by loss of fluid and the presence of gyp in the sucker-rod pump. A down-hole treatment with 50 to 150 gallons of 15 percent hydrochloric acid, preferably inhibited, should remove the deposit from the subsurface equipment. Such a treatment gives only temporary relief and, therefore, must be repeated periodically.

Large Volume Pump

Choosing the pump that will satisfactorily produce a heavy, large-volume well is difficult. Seminole area wells which produce from the first or second Wilcox sand are generally the most difficult to pump. This is true because the majority of these wells produce large volumes of abrasive-carrying fluid. Because of the high water-to-oil ratio, the wells must be pumped down before a profitable volume of oil can be produced. This is noticeable when the well has been down for repairs as it takes from 12 to 24 hours or longer, depending upon the length of time that the well has stood idle, to regain normal oil production. Insert pumps of the types previously mentioned equipped with either a metallic or a non-metallic plunger are

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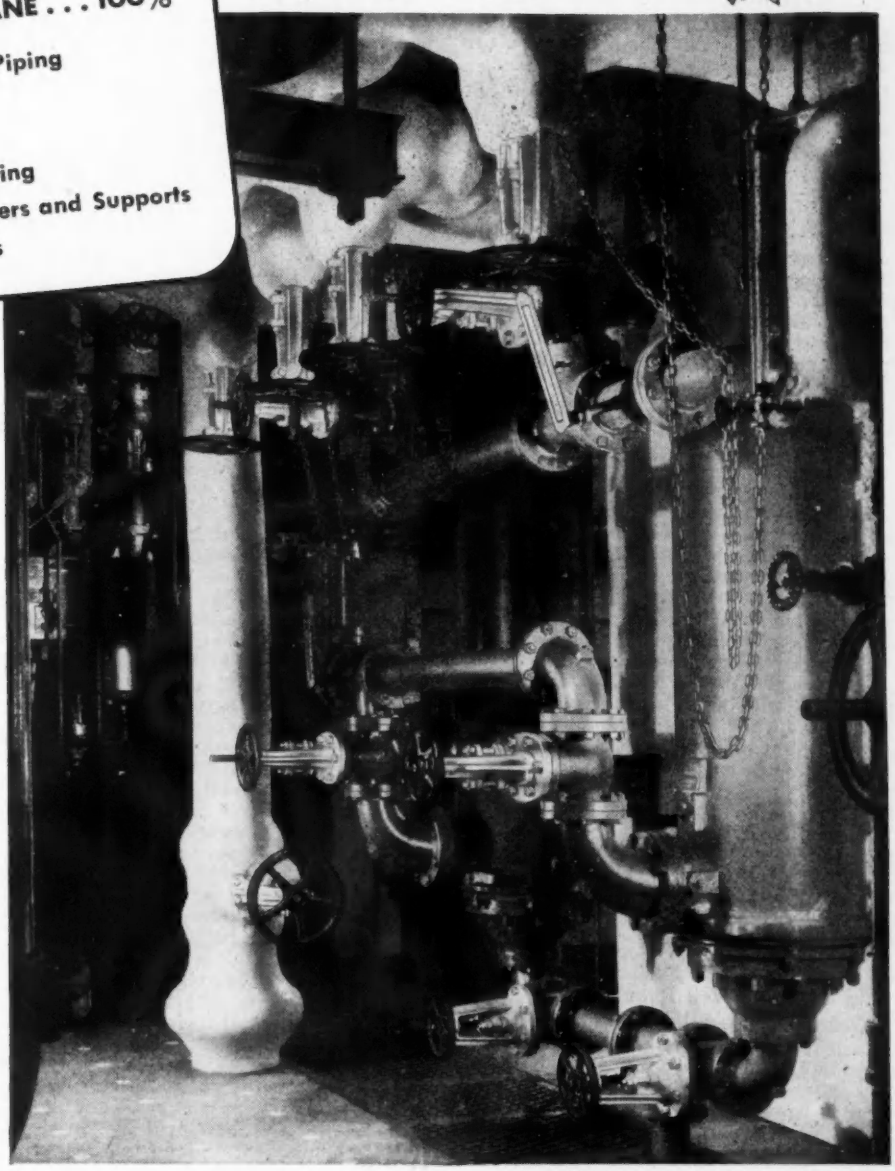
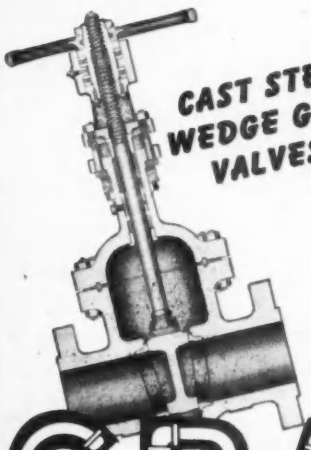
- Unions
- Flanges
- Pipe Covering
- Pipe Hangers and Supports
- Separators



Installation in Industrial Power Plant

ONE STANDARD OF QUALITY

The same high quality protects every part of piping systems when Crane materials are used throughout. In Crane Steel Gate Valves, for example, straight-through ports permit unrestricted flow. Severest line stresses are overcome by sound and rugged body castings. Smooth operation is maintained by a ball joint type stuffing gland, strong tee-head disc-stem connection, and ample stem bearings. Positive seating is assured by extra long disc guide ribs.



CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

employed. Frequency of pump replacement at the Wilcox sand wells varies with the type of pump installed, the characteristics of the individual well, and the number of sucker-rod failures.

Well characteristics must be considered when reviewing pump service. At those wells where sand or other abrasive material is a major problem, pump replacements are rather frequent. A metallic plunger, top anchor pump generally gives the best service in extremely sandy wells. The rings, cups, or repack of a composition plunger are usually worn or cut off by sand, whereas a metal plunger is worn and scored. Use of gravel or other filter is helpful in removing sand before it enters the bottom-hole pump. In addition to sand, the presence of free gas in the pump hinders pump action and results in harmful pounding and poor service.

Sucker-Rod Failures and Pumps

The frequency of sucker-rod failures at any well has a direct bearing on the number of pump replacements, particularly if the rod failure occurs at an interval approaching the length of a normal pump run. For example, if a normal pump service period at a well is 30 days and the sucker rods fail three weeks after the pump was installed, in all probability, the pump will be replaced when the rods are fished. Frequently when rod failures occur at a well where a pump with composition cup type holddown is in use, the seating cups are turned or torn off during the process of fishing the rods. Any resulting pump replacement is, therefore, made before the pump fails. Actual frequency records covering a group of wells show that pump replacements tend to increase in the same proportion as sucker-rod failures.

Successful sucker-rod service is a prerequisite for successful pump operation, so any deviation from normal sucker-rod service affects production and is a pumping problem. Owing to the existence of both heavy and light wells in the Seminole area, both large and small diameter sucker rods are used. The small volume wells do not, in most cases, present a sucker-rod problem. They are produced with small bore pumps operating at a slow, easy motion which results in light loading. This in turn makes possible excellent sucker-rod service. Many of the light wells in this area are equipped with their original sucker rods. Sucker-rod service periods of 10 to 12 years are not uncommon in such wells. The use of either ⅝-inch, ¾-inch, or a combination of the two in the form of a balanced tapered sucker-rod string has been found satisfactory for producing light wells.

Medium Well Requirements

Medium class wells with no excessive sucker-rod trouble are, for the most part, equipped with a straight ¾-inch, or a tapered ⅞ and ¾-inch string. Sucker rods usually give satisfactory service for a period of 4 to 8 years depending upon abuse and the magnitude of the polished-rod load. Dynamometer tests show that these wells have a polished-rod load ranging from 12,000 to 16,000 pounds. A few wells in this weight class are very corrosive, causing poor sucker-rod service. Where corrosion exists, the best procedure is to get the type and size of sucker rods which give the best service and to employ them in conjunction with a rather liberal replacement policy, not permitting, of course, the operating cost to exceed the revenue obtained from the oil sales.

The third or heavy class of wells is the group that makes the production of oil in the Seminole area a tough proposition. This group includes all of those fast-running heavy water wells where sucker-rod, tubing, and pump failures are a common occurrence. If failures are daily occurrences the well should be plugged. At these wells, it is necessary to handle large volumes of salt water in order to produce a relatively small volume of oil, salt water sometimes representing 98 percent of the fluid produced. These large volumes of salt water necessitate use of large-bore pumps. The load applied to the sucker rods while operating a pump at a specific depth and uniform fluid level depends, to a great extent, upon the size of the pump plunger and the density of the fluid being produced; therefore, when large bore pumps are employed to handle a fluid which is mostly salt water, the sucker rods are heavily loaded unless high fluid level exists in the well. Polished-rod loads ranging from approximately 16,000 to 26,000 pounds are found at heavy wells and these loads warrant use of larger diameter sucker rods. Sucker-rod strings found in the heavy wells include the following combinations: ⅞ and ¾-inch tapered strings, 1, ⅞, and ¾-inch tapered strings; 1 and ⅞-inch tapered strings. Field records indicate that because of corrosion at Seminole sucker rods made of an SAE 4620 steel render the best service in this group of wells.

Crooked Holes and Sand

In addition to the salt water problem, many of the wells in the Seminole area were drilled at a time when early penetration of the pay sand was the main objective and some of the holes are quite crooked. This fact, coupled with the presence of sand, often leads to excessive sucker-rod and tubing wear. Sucker-rod and tubing failures resulting from worn and fatigued rod couplings or rod-cut tubing joints are quite common. With the exception of rotating or replacing tubing joints, little can be done to alleviate or eliminate rod-cut tubing. On the other hand, much can be done to reduce sucker-rod joint failures resulting from coupling fatigue or wear. If accurate records are kept covering location and frequency of sucker-rod coupling failures or if excessive coupling wear is noted at the time the well is serviced, a coupling replacement can be made which will eliminate or prevent sucker-rod coupling breaks. When making such a replacement, there must be considered 1, the condition of the rods on which the couplings are to be installed, and 2, past history of coupling service. If excessive coupling failures are being experienced in a well, it is not necessarily good practice immediately to change all of the couplings in the section giving trouble. First, a thorough check should be made of the number of body or pin failures that have occurred in the same zone with the coupling failures. In other words, if excessive rod failures are occurring in addition to coupling breaks, it is not economical to replace the couplings alone, but it would be advisable to replace the rods. If coupling failures alone are experienced, replacement of the couplings is justified. The major causes of coupling failure are excessive wear, fatigue, or a combination of both. Before making any replacement, available records should be reviewed and the pulling crew checked to determine definitely what has caused the coupling failure. Most sucker-rod manufacturers offer API sucker-rod couplings in the standard soft or hardened-and-ground and in the oversize soft or hardened-and-ground types. The regular, or soft, coupling should give better service because it is less susceptible to failure from fatigue but in the case where a wear-resistant coupling is needed, the installation of hardened-and-ground couplings is recommended. In an extreme case of coupling wear, fatigue failure, or both, the use of either oversize hardened-and-ground or oversize soft coupling is the only choice. It is well to remember, however, that oversize couplings cannot be used at random. The controlling factor is the size of the tubing string. For example, 1-inch sucker rods equipped with oversize or 2-3/16-inch outside diameter couplings can be satisfactorily installed and operated inside of 2½-inch nominal size tubing. However, if a coupling failure occurs, it is impossible to fish same because of the limited clearance between the outside diameter of the couplings and the inside diameter of the tubing. In view of what can happen, the size of the tubing string should be carefully checked when a proposal is made to install oversize sucker-rod couplings.

Rod Troubles

Coupling replacements are a great help in reducing rod troubles. This is proved when the rods themselves give satisfactory service for a considerable length of time after installation of new couplings. Quite often, excessive coupling failures occur in a section of rods that has been in service for a considerably upon personal opinion and good breaks), but not frequently. Solution to the question of whether to replace the couplings or the rods depends considerably upon personal opinion and good guessing. In most instances, it is impossible to predict how much longer a section of rods will continue satisfactory. Records show that most coupling replacements are successful if the supervisor has checked each proposed replacement carefully.

In addition to coupling troubles, many sucker-rod pin and body failures are also experienced at the heavy Seminole area wells. Pin failures generally occur as a result of loose joints or coupling failures. Loose joints can be traced to insufficient wrenching of the joints or the presence of dirt, paraffin, gyp, or other foreign material on the pin shoulder or coupling end. Unscrews and resulting pin failures can be eliminated by proper cleaning and make-up of the sucker-rod joints. A review of field records indicates that some pin failures occur simultaneously with, or as an after effect of, coupling failures. In fact, instances are occasionally found where the sucker-rod coupling and pin have failed at the same time. This means that when couplings are failing the pins are subject to failure even though the joints might be made sufficiently tight. In the field, it is commonly noted that where couplings are replaced, several pin failures will follow even though special care is taken to make the joints up properly. This shows the pins evidently have fatigue cracks which developed as the couplings were failing. At heavier wells in this area, the joint

■ CONTINUED ON PAGE 41

LOOK INSIDE before you buy a Power Engine

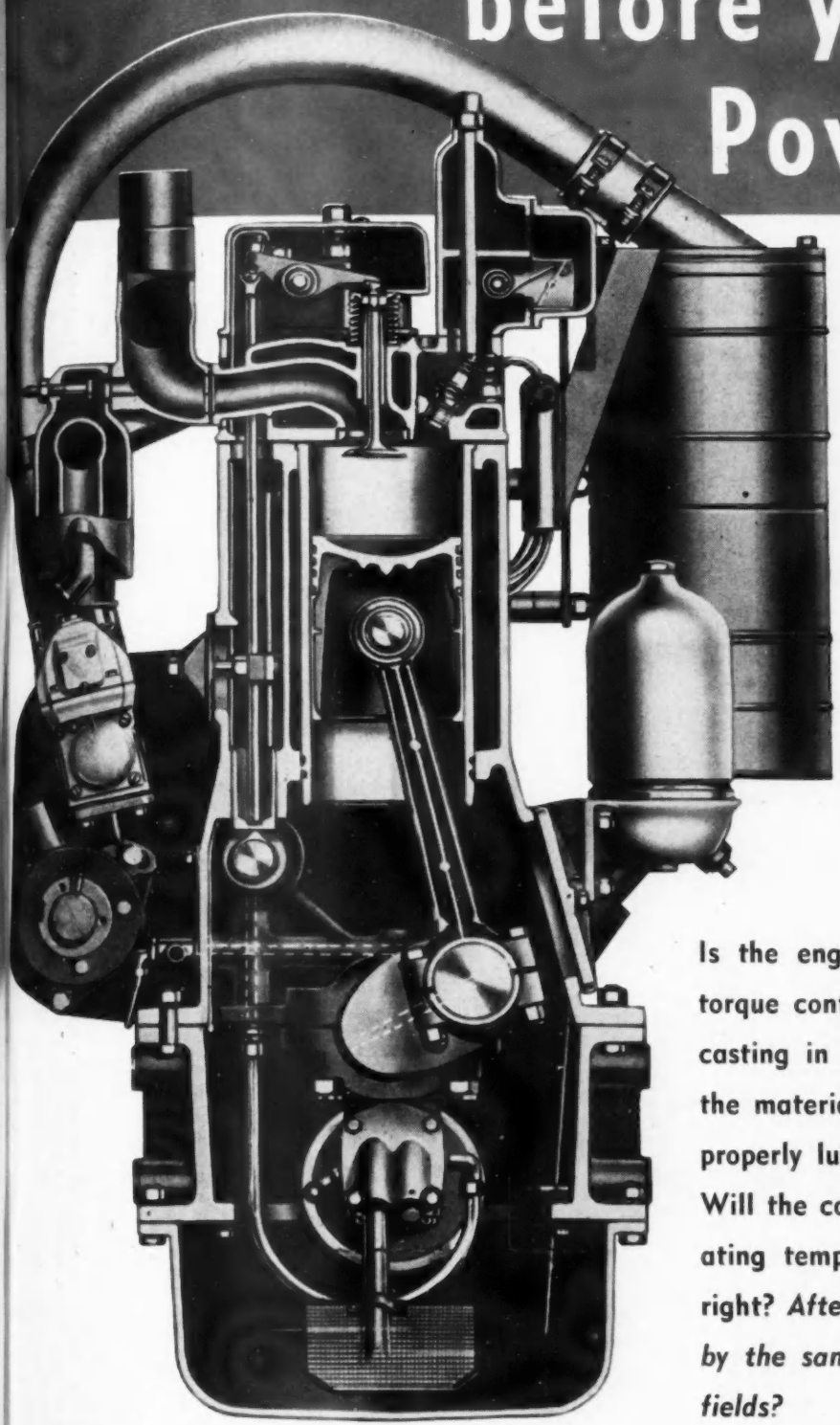


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TABLE OF EXACT TAX TO BE WITHHELD BY EMPLOYER FROM SEMI-MONTHLY EARNINGS OF INDIVIDUALS

INCOME TAX ACT OF 1944 EFFECTIVE JAN. 1, 1945

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FOR THE BRACKET INCLUDING SEMI-MONTHLY EARNINGS UNDER $23.00 WHERE NO EXEMPTIONS ARE CLAIMED THE TAX IS 18% OF THE EARNINGS.

SEMI-MONTHLY EARNINGS - $	NUMBER OF EXEMPTIONS CLAIMED 0	1	2	3	4	5	6	7	8	9	10
10	1.800	NO WITHHOLDING TAX									
20	3.600										
23	4.140										
23	4.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	5.589	1.449	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189
40	7.659	3.519	0.459	0.459	0.459	0.459	0.459	0.459	0.459	0.459	0.459
46	8.901	4.761	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621
46	8.901	4.761	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621
50	9.729	5.589	1.449	0.729	0.729	0.729	0.729	0.729	0.729	0.729	0.729
60	11.799	7.659	3.519	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999
69	13.662	9.522	5.382	1.242	1.242	1.242	1.242	1.242	1.242	1.242	1.242
69	13.662	9.522	5.382	1.242	1.242	1.242	1.242	1.242	1.242	1.242	1.242
70	13.869	9.729	5.589	1.449	1.269	1.269	1.269	1.269	1.269	1.269	1.269
80	15.939	11.799	7.659	3.519	1.539	1.539	1.539	1.539	1.539	1.539	1.539
90	18.009	13.869	9.729	5.589	1.809	1.809	1.809	1.809	1.809	1.809	1.809
92	18.423	14.283	10.143	6.003	1.863	1.863	1.863	1.863	1.863	1.863	1.863
92	18.423	14.283	10.143	6.003	1.863	1.863	1.863	1.863	1.863	1.863	1.863
100	20.223	15.939	11.799	7.659	3.519	2.079	2.079	2.079	2.079	2.079	2.079
110	22.473	18.009	13.869	9.729	5.589	2.349	2.349	2.349	2.349	2.349	2.349
115	23.598	19.044	14.904	10.764	6.624	2.484	2.484	2.484	2.484	2.484	2.484
115	23.598	19.044	14.904	10.764	6.624	2.484	2.484	2.484	2.484	2.484	2.484
120	24.723	20.169	15.939	11.799	7.659	3.519	2.619	2.519	2.619	2.619	2.619
130	26.973	22.419	18.009	13.869	9.729	5.589	2.889	2.889	2.889	2.889	2.889
138	28.773	24.219	19.665	15.525	11.385	7.245	3.105	3.105	3.105	3.105	3.105
138	28.773	24.219	19.665	15.525	11.385	7.245	3.105	3.105	3.105	3.105	3.105
140	29.223	24.659	20.115	15.939	11.799	7.659	3.519	3.159	3.159	3.159	3.159
150	31.473	26.919	22.365	18.009	13.869	9.729	5.589	3.429	3.429	3.429	3.429
160	33.723	29.169	24.615	20.079	15.939	11.799	7.659	3.699	3.699	3.699	3.699
161	33.948	29.394	24.840	20.286	16.146	12.006	7.866	3.726	3.726	3.726	3.726
161	33.948	29.394	24.840	20.286	16.146	12.006	7.866	3.726	3.726	3.726	3.726
170	35.973	31.419	26.865	22.311	18.009	13.869	9.729	5.589	3.969	3.969	3.969
180	38.223	33.669	29.115	24.561	20.079	15.939	11.799	7.659	4.239	4.239	4.239
184	39.123	34.569	30.015	25.461	20.907	16.767	12.627	8.487	4.347	4.347	4.347
184	39.123	34.569	30.015	25.461	20.907	16.767	12.627	8.487	4.347	4.347	4.347
190	40.473	35.919	31.365	26.811	22.257	18.009	13.869	9.729	5.589	4.509	4.509
200	42.723	38.169	33.615	29.061	24.507	20.079	15.939	11.799	7.659	4.779	4.779
207	44.298	39.744	35.190	30.636	26.082	21.528	17.388	13.248	9.108	4.968	4.968
207	44.298	39.744	35.190	30.636	25.082	21.528	17.388	13.248	9.108	4.968	4.968
210	44.973	40.419	35.865	31.311	26.757	22.203	18.009	13.869	9.729	5.589	5.049
220	47.223	42.669	38.115	33.561	29.007	24.453	20.079	15.939	11.799	7.659	5.319
230	49.473	44.919	40.365	35.811	31.257	26.703	22.149	18.009	13.869	9.729	5.589
230	49.473	44.919	40.365	35.811	31.257	26.703	22.149	18.009	13.869	9.729	5.589
240	51.723	47.169	42.615	38.061	33.507	28.953	24.399	20.079	15.939	11.799	7.659
250	53.973	49.419	44.865	40.311	35.757	31.203	26.549	22.149	18.009	13.869	9.729
253	54.648	50.094	45.540	40.986	36.432	31.878	27.324	22.770	18.630	14.490	10.350
253	54.648	50.094	45.540	40.986	36.432	31.878	27.324	22.770	18.630	14.490	10.350
260	56.223	51.669	47.115	42.561	38.007	33.453	28.899	24.345	20.079	15.939	11.799
270	58.473	53.919	49.365	44.811	40.257	35.703	31.149	26.595	22.149	18.009	13.869
276	59.823	55.269	50.715	46.151	41.607	37.053	32.499	27.945	23.391	19.251	15.111
276	59.823	55.269	50.715	46.161	41.607	37.053	32.499	27.945	23.391	19.251	15.111
280	60.723	56.169	51.615	47.061	42.507	37.953	33.399	28.845	24.291	20.079	15.939
290	62.973	58.419	53.865	49.311	44.757	40.203	35.649	31.095	26.541	22.149	18.009
299	64.998	60.444	55.890	51.336	46.782	42.228	37.674	33.120	28.566	24.012	19.872
299	64.998	60.444	55.890	51.335	46.782	42.228	37.674	33.120	28.566	24.012	19.872
300	65.223	60.669	56.115	51.561	47.007	42.453	37.899	33.345	28.791	24.237	20.079
310	67.473	62.919	58.365	53.811	49.257	44.703	40.149	35.595	31.041	26.487	22.149
320	69.723	65.159	60.615	56.061	51.507	46.953	42.399	37.845	33.291	28.737	24.219
322	70.173	65.519	61.065	56.511	51.957	47.403	42.849	38.295	33.741	29.187	24.633
322	70.173	65.519	61.065	56.511	51.957	47.403	42.849	38.295	33.741	29.187	24.633
330	71.973	67.419	62.855	58.311	53.757	49.203	44.549	40.095	35.541	30.987	26.433

FIRST SURTAX BRACKET

SECOND SURTAX BRACKET

TAX ON ODD DOLLARS AND CENTS

EARNINGS	TAX	EARNINGS	TAX
0.05	.011	1.00	.225
0.10	.023	2.00	.450
0.15	.034	3.00	.675
0.20	.045	4.00	.900
0.25	.056	5.00	1.125
0.30	.068	6.00	1.350
0.35	.079	7.00	1.575
0.40	.090	8.00	1.800
0.45	.101	9.00	2.025
0.50	.113	10.00	2.250
0.55	.124	20.00	4.500
0.60	.135	30.00	6.750
0.65	.146	40.00	9.000
0.70	.158	50.00	11.250
0.75	.169	60.00	13.500
0.80	.180	70.00	15.750
0.85	.191	80.00	18.000
0.90	.203	90.00	20.250
0.95	.214	100.00	22.500

EXAMPLE.

SEMI-MONTHLY EARNINGS: $139.97 EXEMPTIONS CLAIMED: 2

FROM TABLE:	$138.00 UNDER 2 EXEMPTIONS TAX IS	$19.665
	1.00 TAX IS	.225
	.97 (NEAREST NICKEL .95) TAX IS	.214
	139.97 (TO NEAREST NICKEL) TOTAL TAX	$20.10

NORMAL TAX BRACKET

TAX ON ODD DOLLARS AND CENTS

EARNINGS	TAX
0.10	.003
0.20	.005
0.30	.008
0.40	.011
0.50	.014
0.60	.016
0.70	.019
0.80	.022
0.90	.024
1.00	.027
2.00	.054
3.00	.081
4.00	.108
5.00	.135
6.00	.162
7.00	.189
8.00	.216
9.00	.243

EXAMPLE:

SEMI-MONTHLY EARNINGS: $62.83 EXEMPTIONS CLAIMED: 3

FROM TABLE:	$60.00 UNDER 3 EXEMPTIONS TAX IS	$0.999
	2.00 TAX IS	.054
	.83 (NEAREST DIME .80) TAX IS	.022
	62.83 (TO NEAREST DIME) TOTAL TAX	$1.08

FIRST SURTAX BRACKET

TAX ON ODD DOLLARS AND CENTS

EARNINGS	TAX	EARNINGS	TAX	EARNINGS	TAX
0.05	.010	0.55	.114	1.00	.207
0.10	.021	0.60	.124	2.00	.414
0.15	.031	0.65	.135	3.00	.621
0.20	.041	0.70	.145	4.00	.828
0.25	.052	0.75	.155	5.00	1.035
0.30	.062	0.80	.166	6.00	1.242
0.35	.072	0.85	.176	7.00	1.449
0.40	.083	0.90	.186	8.00	1.656
0.45	.093	0.95	.197	9.00	1.863
0.50	.104				

EXAMPLE: SEMI-MONTHLY EARNINGS: $99.47. EXEMPTIONS CLAIMED 3

FROM TABLE:	$92.00 UNDER 3 EXEMPTIONS TAX IS	$6.003
	7.00 TAX IS	1.449
	.47 (NEAREST NICKEL .45) TAX IS	.093
	99.47 (TO NEAREST NICKEL) TOTAL TAX	$7.55

USE OF TABLES

(1) Under SEMI-MONTHLY EARNINGS DOLLARS find nearest entry less than (or equal to) earnings on which tax is desired. If this entry is repeated in the table, always use lower line of figures.

(2) In line with this figure and to the right, find tax on this amount under proper NUMBER OF EXEMPTIONS CLAIMED. (This tax will lie in a bracket outlined in heavy lines which will show whether the earnings are to be taxed in the Normal Tax Bracket, the First Surtax Bracket, or the Second Surtax Bracket.)

(3) To this tax ADD on additional dollars and cents of earnings from the small tables in the correct tax bracket as found in (2). In finding total tax, consider earnings to nearest dime if in Normal Tax Bracket and to nearest nickel if in Surtax Brackets (SEE EXAMPLES.)

Computing Withholding Taxes Under New Law

Exemptions, length of pay period and earnings of employes dictate amount to be withheld by employer to conform with act becoming effective January 1

WITH the beginning of the new year, the individual income tax act of 1944 becomes operative. Every employer will then be required to withhold a certain tax from income of the individual employes, the amount of which depends on three factors:

(a) The number of exemptions claimed by the employe (one exemption each may be claimed for the employe, the spouse, and each dependent).

(b) The length of the pay period; i.e., daily, weekly, bi-weekly, semi-monthly, or monthly.

(c) The earnings for that pay period.

Since the computation of the exact withholding tax is a laborious process, the tax law permits the employer the option of using government tables in which the withholding tax is obtained from wage brackets. The tax so obtained, in most instances, will be greater than or less than the exact withholding tax. Most employers would prefer to withhold the *exact* amount of tax as prescribed by law if a *simple* method of obtaining it were available. The employes, too, would prefer such an arrangement.

The accompanying table (see opposite page this issue) for obtaining the exact withholding tax is one of several devised by M. M. Slotnick and J. A. Brooks, Jr., of Humble Oil & Refining Company. This table is based on semi-monthly pay periods; the others are for daily and weekly pay periods. For bi-weekly and monthly pay periods the weekly and semi-monthly tables can be used. By means of them the exact withholding tax on any wages can be obtained in a matter of a few seconds.

Attention is called to the fact that a patent covering the method used in these tables has been applied for.

The use of these tables is quite simple, as a few examples will show.

Suppose, for example, that an employe earns $163.89 in a semi-monthly pay period and that he has claimed three exemptions, for himself, his wife, and one dependent child. Under the column "Semi-monthly Earnings—$" the nearest entry less than this earned amount is 161, which occurs twice. Since the income is greater than $161, the lower entry is used. In line with the lower $161 under "3 exemptions claimed," the amount is 20.286 and lies in the second surtax bracket. To this must be added the tax on the additional $2.89 (amount earned over $161). In the second surtax bracket the tax on $2 is seen to be .450 and for 89 cents (i.e., 90 cents since the nearest nickel will suffice) is .203. Therefore, the exact withholding tax on $163.89 (with three exemptions claimed) is computed thus:

For $161.00—tax is	$20.286
For $2 (Second Surtax Bracket) tax is	.450
For $0.90 (Second Surtax Bracket) tax is	.203
(nearest nickel)	
Exact withholding tax is	$20.94

Suppose, now, an employe has earned $143.85 for the semi-monthly pay period and has claimed 5 exemptions. The table shows immediately that he is subject to the first surtax bracket, and his exact withholding tax is computed quickly in this manner:

140.00	7.659
3.00	.621
.85	.176
Exact Tax	8.46

These tables for various pay periods will soon be available for general sale.

Seismograph Surveys to be Permitted in Osage County

The Osage Indian reservation comprising Osage County in Oklahoma where many oil fields have been discovered, is open to seismograph exploration under limited conditions, according to an announcement by T. B. Hall, superintendent of the Indian agency at Pawhuska. The action was voted by the tribal council following repeated requests by several major and independent oil companies that seismic surveys be permitted to assist in defining new structures. Among the applicants was Continental Oil Company which recently paid the largest bonus of the year for an oil lease at a recent public auction.

Superintendent Hall said that the areas where surveys may be conducted under certain conditions include: All of townships 23 and 24n, Range 3, lying within the boundaries of Osage County; all of Sections 4, 5, 6, 7, 8, 9 and parts of sections 16, 17 and 18, in 23n-4e of Osage County.

Any individual, corporation, or company contemplating a seismograph survey of the area described or any part thereof should communicate with Superintendent Hall at Pawhuska, Oklahoma, who will underline the conditions under which the work may be done.

☆

T. T. GALLOWAY, industrial relations supervisor for Creole Petroleum Corporation, in the Jusepin district of eastern Venezuela, is returning to his post after conferring in Tulsa with officials of The Carter Oil Company.

Seminole Pumping Problems

■ CONTINUED FROM PAGE 38

(coupling and pin) failures are approximately 50 percent of the sucker-rod failures and, therefore, any effort toward proper cleaning and make-up of sucker-rod joints is time well spent.

Sucker-rod body failures also rank high in the trouble list. With the exception of those caused by an extremely overstressed condition, sucker-rod body failures usually start at a fatigue crack at the bottom of a kink, notch, or corrosion pit. For this reason, the forerunners of many sucker-rod body failures can be developed before the rods reach the well. If sucker rods are roughly handled or improperly stored during the trip from the manufacturer to the point of service, some of them will receive kinks or notches which may cause body failures after the rods have been placed in service. Careful handling of sucker rods before their installation cannot be overemphasized.

Chances of damaging sucker rods increase considerably after the rods are placed in service and overloading and rough handling should be studiously avoided. When sucker rods are overstressed for an appreciable period or have become fatigued, a series of body failures will usually occur at the top of a string or section. If this happens to undamaged, relatively new rods, it can safely be concluded that an overloaded condition exists. The polished-rod load then should be determined with a dynamometer or by using one of the various available formulae and when this is known, it is a simple matter to calculate the unit stress under which the rods are operating. Then a logical recommendation can be made regarding the need for larger-diameter sucker rods. Before installing larger rods, the possibilities of reducing the pump bore should be investigated and if this change can be made, the reduction in polished-rod load may defer the sucker-rod replacement.

A string of rods may be permanently damaged by pulling or jarring on them while trying to unseat a pump that is stuck or sanded up. Also, where it is common practice to lay down, rather than to hang sucker rods, they may be severely kinked or bent if the pulling crew is not careful. To do this job properly, the rods should be laid down in singles or doubles and should be "tailed" both to and from a suitable rod rack. Conditions and practices which ultimately result in sucker-rod failures should be minimized and when possible, eliminated.

Heavy Wells Troublesome

The over-all picture of the Seminole area indicates that the light and medium class wells do not give any more trouble from the pumping standpoint than do similar wells in other districts. However, the heavy wells, estimated at 25 percent of the total in this area, are a constant source of trouble from both the sucker rod and the pump angles. This is primarily due to the presence of sand, crooked holes, and high polished-rod loads resulting from the necessity of producing large volumes of salt water in order to obtain a profitable volume of oil. And as long as the large-volume Seminole area wells remain in operation, they will present never-ending pumping problems.

(1) Under SEMI-MONTHLY EARNINGS DOLLARS find nearest entry less than (or equal to) earnings on which tax is desired. If this entry is repeated in the table, always use lower line of figures. tax will lie in a bracket outlined in heavy lines which will show whether the earnings are to be taxed in the Normal Tax Bracket, the First Surtax Bracket, or the Second Surtax Bracket.) finding total tax, consider earnings to nearest dime if in Normal Tax Bracket and to nearest nickel if in Surtax Brackets (SEE EXAMPLES.)

New Champion
Standard Oil Company of California's KCL-20-13 hit 16,000 feet and kept on going. NATIONAL Seamless Casing was used at top and bottom of 7-inch string.

10,999 feet of 4½-inch and 2,150 feet of 3½-inch NATIONAL Drill Pipe were used in drilling this record well.

UNITED S

World's deepest well record broken again. Now passed 16,000 feet.

Where tension was greatest and collapse danger highest they used **NATIONAL SEAMLESS CASING**

THE new record for deep oil wells came back to California when Standard Oil Company's Coles Levee wildcat passed 15,279 feet and kept on going.

Two strings of casing were used. One 11¾-inch O.D. Casing was cemented at 1,188 feet. The second, a 7-inch O.D. string was cemented at 10,999 feet. The top and the bottom of this string, where tension and collapse are respectively greatest, were NATIONAL Seamless. Once again the reputation of NATIONAL Seamless Casing for safe and reliable service is confirmed in this outstanding performance.

The drill pipe used consisted of 5 9/16-inch O.D. Drill Pipe for drilling the first 15½-inch hole to 1,188 feet. From there, a 4½-inch string of NATIONAL SEAMLESS DRILL PIPE carried a 10⅝-inch hole to 10,999 feet. Below this, to the present depth, 3½-inch Drill Pipe was used, a portion of which was NATIONAL Seamless.

The total weight of the drill pipe and accessory equipment approximates 250,000 pounds. With such weight to handle, it is particularly significant that standard equipment and materials performed so well.

The world over, more NATIONAL Seamless Drill Pipe, Casing and Tubing are used than any other tubular goods. The logic of experience is always convincing.

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NATIONAL SEAMLESS *drill pipe... casing... tubing*

D S T A T E S S T E E L

The Employe's Role—

J. Shell Hears About Public Relations

CUTTING straight through the formality of a wordy introduction and getting directly at what it wants to say, Shell Oil Company is bringing its public relations problem to employes in terms of their own activity. To acquaint Shell people with the increasing importance of good public relations and what effect they have on employes, the company, and the general public, Shell is putting on a campaign designed to reach everyone in its family of 28,000. The campaign began last month with publication of a booklet, "We Call It Public Relations," which illustrates with slyly humorous cartoon-style drawings, the simple story of Joe Doakes and Joe Shell.

The booklet describes the individual relationship of each employ to the various Shell "publics"—the general public, customers, dealers, stockholders, and employes—as the starting point for public good will. Public relations then are made up of "the things we do or say to make people like and understand us," the booklet says.

Educating Joe

Joe Doakes, the fellow on the first page of the booklet, didn't understand the first rule of sound public relations. He laughed at a stranger who slipped on a banana skin. The stranger didn't think his fall was funny, and tried to impress Doakes with that fact immediately by giving him a shiner. Doakes, it is pointed out, "Was a fine fellow all right, but he wasn't very smart about human relations."

Joe Shell, we are told, is a fine fellow, too, but if he is not careful he may also get a black eye in a number of different ways, in many different places. He has to watch out for "human relations" or, as it is sometimes called, "public relations."

A friendly conversation over the back fence with a neighbor, politeness on the highway if you happen to drive a Shell truck or car, thoughtfulness over the telephone if your duties with Shell require you to talk to the public by this means, observance of the "customs of the area" if you work in production—these and a long list of other customary, every-day actions by employes can be made the strongest support for good public relations, easy to be appreciated by the public when used with forethought, but quickly disparaged when carelessly handled.

Shell employes are natural ambassadors of good will because they know the advantages of working for an organization that can provide the benefits that Shell does. The reasons that make Shell a good employer are better known by its employes than anybody else. And it is pointed out, along with enumeration of the benefits, that everybody connected with the company, the "Shell family working together makes up the whole Shell team—the thing the public knows as the company."

Even the reason for good public relations is stated in "grass root" terms: *A good, strong, well-liked company is a mighty fine guarantee of a good, steady job.* There couldn't be any better reason. What does the Shell employe get out of it? "Well," says Joe Shell, "you get the respect of your neighbors and friends. And you get a lot of satisfaction from your job. But, most important, you get security—that wonderful feeling that comes with knowing your job can last as long as you want it."

Typical sketch used in Shell booklet. The underlines read: "The good will employes build for the company is more than an over-the-fence proposition. It works in a lot of ways for everyone."

That the effects of good will are ever widening, like ripples created by a pebble dropped into water, may not always be realized. But approximately one in every 700 persons in the United States is directly or indirectly connected with Shell. "If each member of this vast family will make just a few good friends, will do his bit to endear himself to the people he meets, will have a good word for his associates and his company, an amazing thing will happen. Before a year rolls around, he will find that the Shell family has thousands of new friends—and supporters."

The important thing to remember, Shell employes are told, is that out of the entire population of the United States, approximately 132,000,000 people known as the general public, "quite a few don't even know that Shell exists." As many as a few million may have heard about the company through reading the signs or advertisements over the country, but have never had any dealings with Shell. A large number are perhaps casual or occasional customers, but actually only about 2,500,000 are the company's regular customers.

Little Things Count

Matters that reflect on the company may seem small and of no direct consequence. But the warning is given that an extra measure of good will is the best safeguard any organization can have to tide it over the "rough spots." Also, public opinion may react favorably or unfavorably on the company in instances or places far remote from any activity of the company, yet the entire organization may be affected by such opinion. It is noted, for instance, that "the attitude of public officials, and the 50,000,000 voters who elect them, toward highway legislation may make a difference of a thousand jobs for the Shell family."

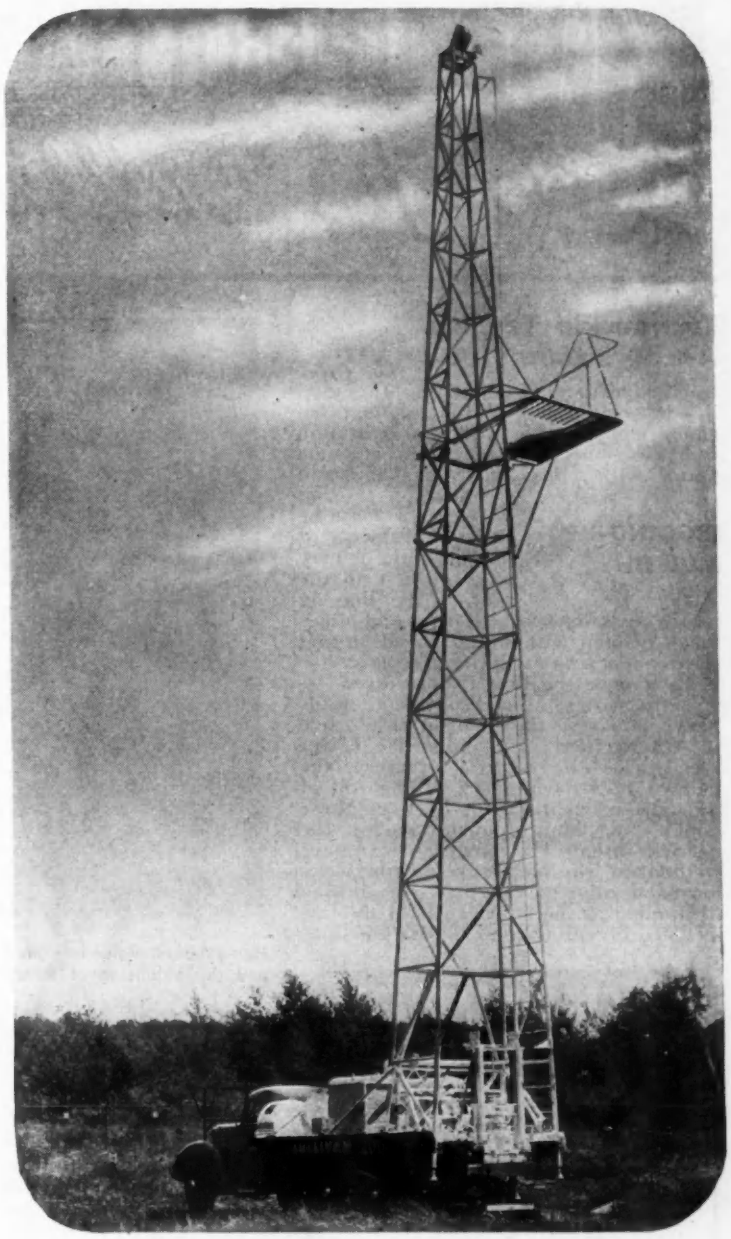
The campaign is being presented to Shell employes in several ways. In some districts meetings are held and small discussion groups go over the booklet. In other areas, employes are given the booklet and asked to read it. Ideas contained in the booklet are never presented in dogmatic fashion. Instead, the whole campaign is based on suggestions. These are given as an aid to the "solution of the age-old problem of getting along with other people." This problem, the reader is told, is after all the major interest of individuals, as of companies.

On the subject of grouches, Shell employes are told that "Nobody believes the company is perfect. And besides, this is a free country and every man with a grouch has a right to air it." And then follows a bit of advice fundamental to the building of good relations within a company. "When you run down the company to outsiders, it sounds almost as if you were running down your wife and children—you can lose the respect of the other fellow if you aren't careful. So if you have something to get off your chest, go to the boss with it. Don't give the company a black eye with the public."

Human Relations

The attempt to create within Shell a better understanding of their part in building the company should not be construed as an effort by the company to "lay down the law or curb any one's personal liberty," it is emphasized. The campaign is merely a sincere endeavor to make it plain that "Public relations is nothing more than keeping Joe Shell from getting that famous black eye. It's human relations, really—getting along with people—making the general public into friends of Shell," and thereby assuring continuation of a company that can add to the general prosperity of the nation when the war is over, by providing good jobs for its employes.

● *Built by* SULLIVAN MACH'Y CO.



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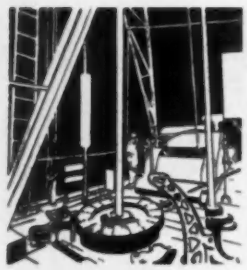
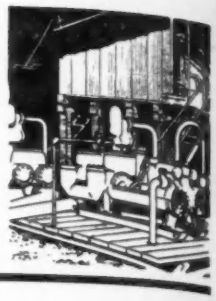


OPERATING HINTS *For Drilling Crews*



Turnbuckle Tension Anchors Mud Line

The problem of anchoring the mud line between pumps and standpipe often causes considerable worry, as vibration is likely in accumulated stress at some point, with consequent breakage and shutdown of the rig. Vibration may be either lengthwise of the pipe run, or may be transverse to the axis of the line, in which case the whip often amplifies when in step with pump pulsation and the tendency toward elongation.

RIGGING-UP MUD LINE

To anchor the line against these destructive forces, one contractor welds heavy hooks to the pipe on either side of where it passes under the lower member of the derrick structure, the pair of hooks being set on the top of the pipe when installed. Between these hooks and point of anchorage on the derrick—usually a chain or an eye welded to the derrick member—are located turnbuckles so that tension may be applied to the hooks to hold the line in both directions against possible shift.

Heavy hooks, welded to mud line, permit attachment of trunbuckles to nearest derrick member and the balancing of tension to snub pulsations, while block absorbs vertical pull of device.

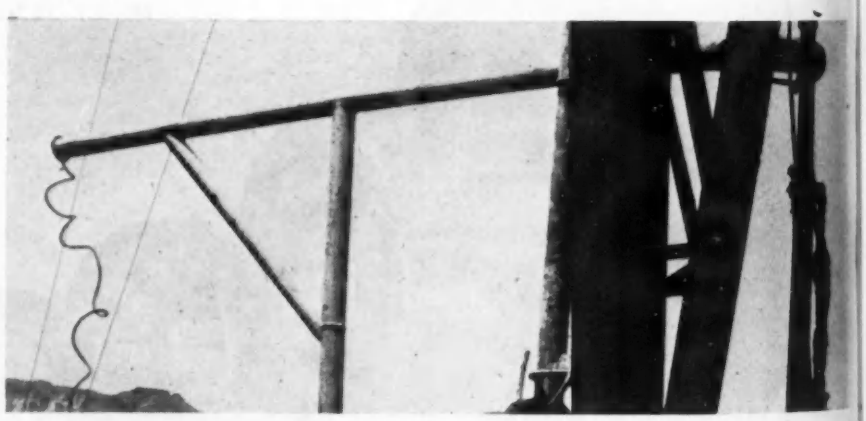
To prevent whipping in a plane which includes the hooks and turnbuckles and to counteract the lifting effect of the hitch, a short piece of heavy timber is set between pipe and derrick member, the pull of the turnbuckles tending to hold the pipe snugly against the block and prevent its dislodgment by even severe pounding.

This hitch carries the additional advantage of being readily released when the pipe is to be shifted. Variations in distance between welded hooks and derrick may be accommodated by the method used for attaching the upper hooks to the derrick, as well as by shift in the amount of thread exposed in the turnbuckles.

Catline Guide Speeds Equipment Transfer

To obtain a horizontal pull on the catline for dragging equipment around the derrick one contractor mounts a 3-inch guide pipe in the derrick and threads the wire line attached to the rope through it. The end of the pipe toward the derrick floor is formed with a long sweep bend, and the pipe opening swaged or formed to bell shape so as not to cut or fray the line as it passed into the pipe. The outer end is also belled, but not bent.

EQUIPMENT HANDLING



Belled horizontal pipe run, with pulley at inner end to direct catline extension, guides wire line and prevents entanglement or pounding at derrick leg, while improving headroom of working space.

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For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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A welded brace between the outer end of the pipe and the support absorbs the stress when the pull is not directly in line with the pipe while the entire unit is chained or clamped to the derrick leg to retain it in place so as to allow proper alignment between cathead and guide.

Wire Line Pad Extends Pipe Racking Base Life

Racking of a long string of drill pipe, even when flushed with water and wiped on the outside, results in the draining of considerable water onto the derrick floor, with resultant messiness and increased hazard to the crew.

DRILL PIPE RACKING

One company places a special floor over the board pipe stand, stringing short pieces of discarded drilling line—in this instance 1¼-inch 6 x 19 wire—diagonally across the stand, and alternating it with short pieces of rope salvaged from worn out catlines. The catline stands up higher than the wire line, tending to swell when wet and rise still further. Thus the rope serves as footing for the pipe stacker, while the wire line supports the weight of the pipe and prevents crushing or cutting of the fibre rope. The steel cable provides runways for the drainage of water which runs from the stacked stands, carrying the flow outward from the working face of the stack and preventing the formation of puddles.

The wire line sections are cut by the welder, care being taken to fuse the wires on either side of the cut to prevent unravelling or the presence of loose ends to snag clothing and increase—rather than decrease—the operating hazard on the rig. Where preformed wire line is used for this sheathing of the pipe rack base, it is found sufficient to bind the ends with tape or wire, merely to prevent lateral displacement of the strand that happens to be under the pipe end when it must be shifted slightly to insure proper racking.

When thus protected by wire line sections, the catline portion of the stand lasts several times as long as when used alone.

Mixing Header on Floor Provides Hot Water

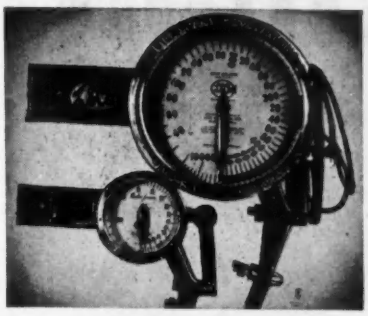
Valves for steam and water lines permit controlled flow into header, and give desired mix.

A steam-water mixing chamber to provide instantly hot water for rig cleaning is a standard piece of equipment on the rigs of one company. Two lines—one steam and the other water—are brought up and terminated with valves at the derrick floor level at some convenient point on the side of the rig, preferably near the driller's side. The mixing chamber, made of an 18-inch length of 3- or 4-inch pipe blanked off at the ends and provided with two short nipple-and-union fittings on the inlet side, and a single outlet on the opposite side is then attached to the outlets. A heavy

RIG FLOOR EQUIPMENT

Alternate lengths of salvaged drilling line and catline, laid diagonally across racking floor, afford steel support for pipe ends, while fibre line gives firm footing without being compacted.

LINE SCALES



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(Above) Super 500,000# capacity, 14" dial. (Below) Packer Special, Capacity 40,000#, 6" dial. 18 other models for every drilling, well servicing, or work-over need.

With a Line Scale you know the pull on the line, and the weight on the bit in pounds. Accurate, sensitive, rugged, durable and economical.

Although we are working at top capacity to supply ship yards and the U. S. Navy—we are still able to furnish Line Scales to the oil industry. Write for folder and prices.

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BE SURE TO CHECK THE
Trading Post Section
ON PAGE 68 OF THIS ISSUE

duty composition hose is attached to the single outlet fitting.

By properly adjusting the flow of steam and water, a hot mixture is quickly obtained that has numerous uses in and around the rig floor. Easily cleaning oil and slime from hand tools, tongs, wire lines and drill pipe subs, and steaming off threaded fittings are but a few of the uses which will save many hours of labor. By making all fittings detachable with small unions the time involved in rigging up the chamber will be negligible.

Mouse Hole Liner Aids Drill Pipe Make-up

A Gulf Coast contractor gains additional use of the mouse hole situated near the rotary table by making it 60 feet deep and casing it with 9⅝-inch casing. By so doing the hole will accommodate the making up of three drill collars without the danger of dropping them in the well, thus adding another safety factor in the handling of drilling equipment.

DRILL PIPE HANDLING

To handle the regular range two joints of drill pipe, a 27-foot joint of 7-inch casing is orange-peeled on the bottom and ears made of 2-inch pipe are welded on opposite sides at the top. Slots are cut in the 9⅝-inch casing to allow the 7-inch casing to be swung in the outer casing by the ears. When drill collars are to be made up, the section of 7-inch is pulled from the mouse hole and placed in the corner of the derrick.

Liner for deep mouse hole supports single joint of pipe, while full hole accommodates collar set-up.

Hinged Treadle Betters Engine Throttle Control

Hinged to working floor over throttle knob, this device gives closer control with less fatigue.

The task of maintaining desired fuel feed with the short or button type of foot accelerator or throttle imposes an unnecessary strain on the operator during long runs or when maintaining power for coming out of a deep hole. One operator simplifies engine operation by placing a hinged strip of light steel over the original control, setting it to fall approximately in line with the driller's foot when operating the rig.

ENGINE CONTROLS

The hinge forms a stop for the driller's heel, while the entire movable section affords a foot rest which requires neither balancing nor relocating between power applications.

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More rollers, more capacity. More rollers, longer life. More rollers, increased rigidity. The Tyson "All-Rolls" Bearing is hailed as the sturdiest and longest-lived bearing ever built for heavy-duty service.

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★ BUY MORE WAR BONDS ★

Multiple Boiler Setting Saves Time and Money

Unusual Tie-Down method, spacing of unit and rapid assembly are features; few critical materials used

A MULTIPLE boiler setting that is permanent as far as all normal operating conditions are concerned, yet has a degree of flexibility of assembling and dissembling that makes for rapid shifting in the field, is saving considerable time and expense for the drilling department of one large company. Each boiler, as in most installations, rest on its own skid base but this installation differs in the manner of tying down the boiler itself as well as in the spacing of the units in the setting as a whole.

Each boiler rests upon a curved steel cradle supported by short, braced stilts of 7-inch pipe, the latter in turn being welded to an I-beam laid laterally across and welded to the top of the skid-base beams. To lend further rigidity to this lateral I-beam member, triangular fillets of heavy steel plate were welded into the angle between it and the skid-base members. In order to hold the boiler down firmly against the supporting cradle, two large turnbuckles were employed. Two hooks, torch-cut out of a piece of heavy plate, were welded to the underside of the boiler shell with their open sides "looking" inward. A similar pair, but with their open sides looking outward, was welded to the top side of the skid-base members. Heavy turnbuckles were then placed between each pair of hooks and cinched down. The turnbuckles thus are tied in at a 45-degree angle and this not only eliminates lateral motion of the boiler but also snubs the unit down firmly in its saddle.

Boilers Automatically Spaced

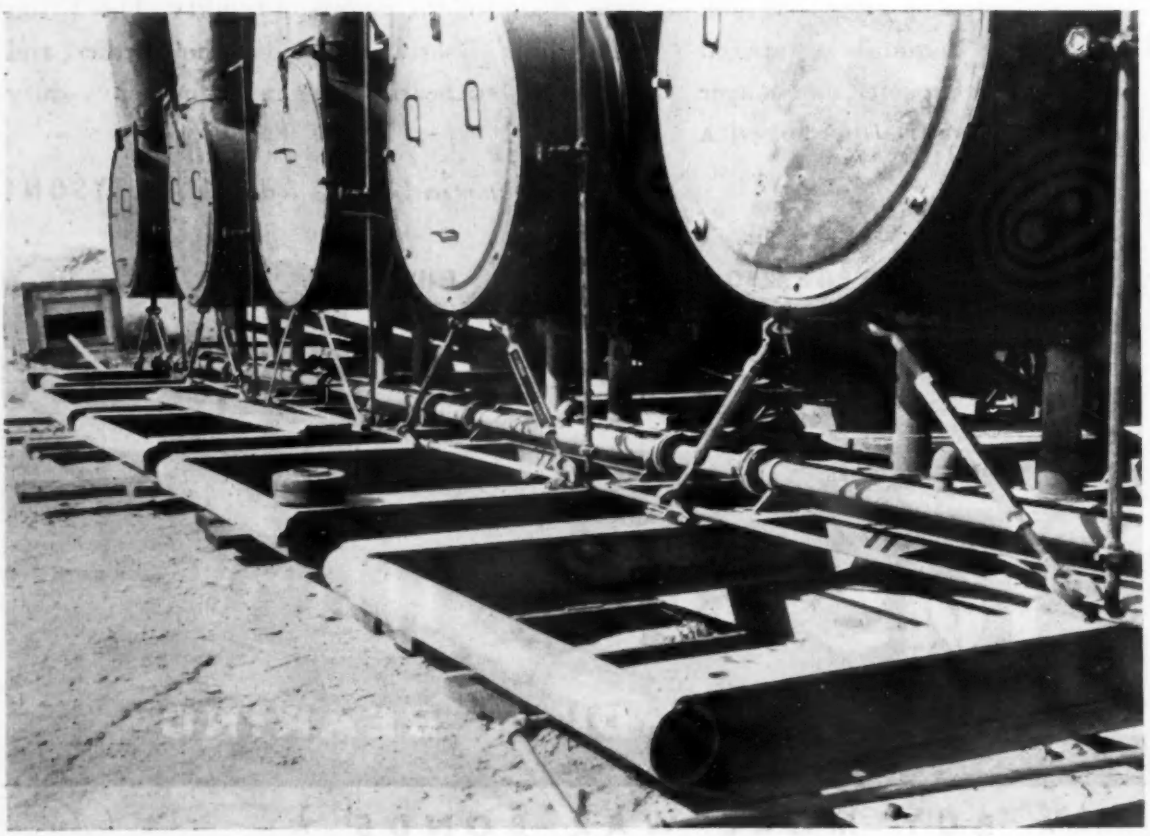
In devising a means of permanently spacing the individual boiler units so that all piping would be perfectly matched each time they were set up at a new location, excellent use was made of the boiler blow-off exhaust manifold line that extends laterally across the width of the boiler setting.

Instead of building a single one-piece line, the manifold was made up in short sections, each skid-mount having a short section equal to the width of and permanently secured across the top side of its own skid section, with the end of each piece terminating in a bolted flange fitting. A short "spindle" or section of similar line, also fitted with flanges then was inserted between each of these individual lengths and bolted together to make a continuous line, this also providing a rigid spacer element between each of the units. Work necessary in breaking down the setting for movement to another location is thus cut down to a minimum, since, with the exception of these several spindles, the blow-down system is completely unitized, each boiler being independently equipped and ready for installation regardless of whether the setting as a whole may at some time be broken up or the individual units shifted around.

Stack Blow-Down Line

Another feature that is unitized with each boiler section is the stack blow-down line system. The 1-inch line laterally extending across the width of the setting was assembled into two sections and joined by a union. Instead of having screwed or welded fittings at each interval for the risers, several short nipples were welded into the line and fitted with unions, the lower ends of the risers being similarly equipped. When breaking down the boiler units this part of the system may be dissembled in a few minutes since only six light unions plus the main steam source connection need be broken down in a 5-unit setting of the kind illustrated. The vertical risers then may be swung back and lashed to the boiler while the latter is being moved.

Simple in design as well as installation, the streamlining features of this type of boiler are bringing about increased savings each time the units are moved. Few critical materials are required, and the entire set-up can be duplicated in a short while by the company welder, and with practically any type of boiler installation.



Picture shows novel multiple boiler setting that is characterized by extreme flexibility of assembling and dissembling but at the same time is "permanent" insofar as all normal operations are concerned.

First West Texas Sour Crude Shipped to Coast

Initial shipment of West Texas sour crude to California was made December 21, when Atlantic Pipe Line Company began loading 1000 barrels daily at its Midland rack for consignment to the Pathfinder Petroleum Company's skimming plant at Los Alamitos, near Long Beach.

The California firm is scheduled to make a trial run of 10,000 barrels. Tank car movement of West Texas crude to augment the supply on the West Coast has been under consideration for more than a year.

FPC Issues Certificates For Lines to TGT Supply

Certificates have been issued by FPC to Hope Natural Gas Company and several subsidiaries of Columbia Gas and Electric Company for natural gas pipe lines to obtain gas from the Tennessee Gas and Transmission Company.

Hope is authorized to continue operation of facilities in Kanawha County, West Virginia. United Fuel Gas Company, Warfield Natural Gas Company and Cincinnati Gas Transportation Company will be permitted to construct and operate additional facilities in Kentucky and West Virginia.

The program calls for United to build 32,800 feet of 12-inch and 4000 feet of 16-inch line in West Virginia and 1995 feet of 10-inch line in Kentucky, while Warfield will build 1350 feet of 10-inch line on one route and 2034 feet of 10-inch line on another, both in Kentucky. The Cincinnati company will build 400 feet of 8-inch line at Leach, Kentucky.

FPC also has approved an application of the Empire Gas and Fuel Company for permission to acquire about eight miles of 8-inch line from its affiliate, the Empire Producing Corporation, between the New York State Natural Gas Corporation pipe line in Hebron County, Pennsylvania, and its own line in Potter County.

Pressure-Welding School Planned by Linde Company

The Linde Air Products Company, with the cooperation of Pressure Weld Company, Houston, will open a training course January 15 to give instructions in pressure-welding overland pipe lines.

The school will be at the warehouses and plant of Pressure Weld Company under direction of Linde Service Operator H. A. Yost, assisted by members of the Pressure Weld Company field force. A welding clamp of the type used in the field, complete with auxiliary equipment, will be used to train the men under actual field conditions. Men will be trained in small groups to give an opportunity for individual instruction. Each student will be provided with a reference manual. Because he actually will operate the pressure-welding equipment, the trainee should bring work clothes with him. The average training period is about two days.

More than 50 welding operators, pipe line inspectors, and other interested field men representing 30 companies were instructed at a similar school last fall.

Information on the school may be obtained from the Houston Office of The Linde Air Products Company, 6119 Harrisburg Boulevard, Houston 11.

International Developments

Two Producing Areas Near Syzran, Russia, Opened

Wildcat tests completed in August and September have opened up two producing areas north of Syzran, on the west side of the Volga, in Russia. The discoveries are reported to have resulted from geophysical tracing of the Krasnyar-Yablonovog trend southwestward into the Zhigulev hills. Other promising geophysical closures along the newly-mapped trend are scheduled for early testing.

This development establishes subsurface structural connection between the trend and that on which the Syzran and Saratov fields are located. Later tests will be put down below Syzran, where the axis of the fold line crosses the Volga River.

South Africa Government Reported to Be Drilling

The government of South Africa is reported drilling two wildcats in the vicinity of Rietbron, near the center of the Great Karroo.

Oil shows have been encountered in sandstones in both wells, it is reported. Geologists regard the area as having possibilities, since a thick section of Permian-Triassic shales and sandstones is known to occur there. The strata are believed Lower Triassic.

Seismograph Explorations Are Under Way in Paraguay

Seismograph explorations for Union Oil Company of California in Paraguay have been started, toward fulfillment of that company's contract with the Paraguayan government. A fully-equipped Western Geophysical Company seismograph party is in the field, and active operations are well under way.

Equipment and personnel are the forerunners of plans which include organization of additional seismograph crews which will be necessary to complete the program called for in the contract which Western has with Union.

Union Oil Company's contract with Paraguay entails an agreement for oil exploration covering a tract of 54,000,000 acres in the Chaco territory. As no wells have been drilled in the Chaco, and no rock outcrops have been found, it will be necessary to depend entirely on the seismograph not only to map structures, but also to draw inferences concerning the thickness of the sedimentary section and other necessary geological information.

There is one fair east-west road which traverses the area, and it is planned at first to run one seismograph line along this road for approximately 150 miles. The results of this line will serve to establish the major syncline of the basin as well as provide indications of any reversals which may be present. Since actual drilling is contemplated within 18 months, every effort will be made to outline at least one favorable area within that time.

The Chaco territory is a flat, heavily wooded area with practically no roads. With the exception of a small Mennonite colony and a few army camps, there are no civilized settlements. Thus, food and all other requirements for the operations must be hauled in from Asuncion. The water supply, both for drinking purposes and for operations, will be obtained from wells which will be drilled at camp locations.

Buildings are being constructed near the center of the region which will serve as headquarters for operations as well as provide housing facilities for the personnel.

Venezuela Well Completed

S. A. P. Las Mercedes (The Texas Company) had run an electric log and was in the process of completing its eighth well in the Mercedes field, north central Guarico, Venezuela, on December 15, and had location prepared for No. 9 well. The field is on 600-meter spacing, with approximately 550 acres proved, with seven shut-in producers.

Manapire Wildcat Spudded

Manapire 2 wildcat, of S. A. P. Manapire (The Texas Company) was spudded during the second week of December, with surface casing set at 43 feet. The location is 15 miles southeast of the Mercedes field, state of Guarico.

San Martin Wildcat Begun

Rigging up is underway for Shell's second test well in the San Martin tract of northwestern Meta, Colombia. The location is approximately 65 miles southeast of Bogota. San Martin No. 1 was completed early in November as "an excellent producer of fresh water." The No. 2 location is 200 meters west of the No. 1 failure.

Colombia Wildcat Planned

Texas Petroleum Company (Colombia) has finished river terminal facilities at Puerto Nino on the Upper Magdalena, and equipment is being assembled for drilling the first wildcat in the company's Velasquez block, western Boyaca. Velasquez No. 1 will be drilled on a prominent anticlinal structure mapped by seismograph. The location is 30 kilometers south of Puerto Boyaca.

Union Sulphur Elects

Union Sulphur Company, Sulphur, Louisiana, announces election of H. F. Whiton, as president. He was previously vice president and treasurer, and for the past several years has been in charge of the company's oil operations, with headquarters in Louisiana.

Frank B. Markle has been appointed vice president. He has successively held the positions of production superintendent and assistant to the vice president. He has been with the company since 1940.

☆

C. O. DAVIS, former district superintendent for Pure Oil Pipe Line Company in the Muskogee, Oklahoma, district, has been named assistant to the general manager of the company in Michigan, with headquarters at Mount Pleasant.

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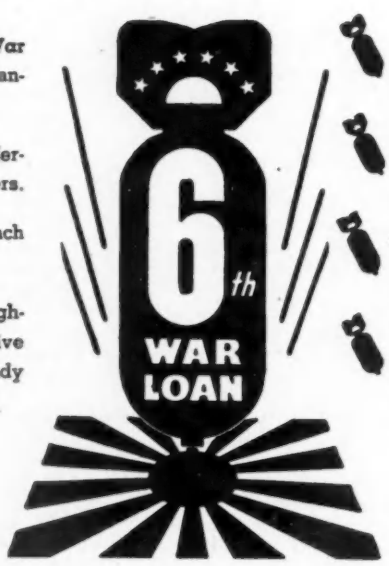

- Make definite **Assignments** to those best equipped to arrange music, speeches, rallies, competitive progress boards and meeting schedules.
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THE OIL WEEKLY

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Crude Production and Refinery Runs Up, But Withdrawals Made from Fuel Stocks

The industry increased production and refinery runs of crude in the week ended December 23, reports to the American Petroleum Institute showed, affording larger refinery output of principal products. But still it was necessary to draw heavily on stocks of both light and heavy fuel oils, while there was a subnormal seasonal addition to stocks of gasoline. These figures gave evidence of the very great requirements for the industry's products, for both crude production and refinery runs were fairly close to all-time record levels reached a few months ago.

Crude output of 4,729,000 barrels daily was within about 30,000 barrels of the record, and was 367,000 daily or 8.4 percent above production in the like week a year ago. Crude runs to stills, at 4,682,000 barrels daily, were within 100,000 barrels of the highest on record and exceeded runs in the corresponding week a year ago by 478,000 daily or 11.4 percent. Crude oil stocks in the United States totaled 222,075,000 barrels December 16, not far above the 23-year low and about 20,000,000 barrels or 8 percent less than stocks a year ago.

Gasoline production of 2,091,000 barrels daily was 70,000 more than in the previous week and 294,000 daily or 16 percent more than a year previously. Stocks accumulated at the rate of 87,000 barrels daily in rising to 83,355,000 barrels, an amount 10,336,000 barrels or 14 percent above that held a year before.

Gasoil and distillate fuel production of 658,000 barrels daily, up 36,000 from the week before, was 28,000 a day or 4.4 percent more than in the like week a year ago. Stocks were used up at the rate of 224,000 barrels daily, declining to 40,846,000 barrels. That quantity was about 2,000,000 barrels or 15 percent less than the amount held a year previously.

Residual fuel oil production of 1,257,000 barrels daily was 10,000 a day higher than in the previous week and 15,000 a day or 1.2 percent higher than in the like week a year ago. Stocks were reduced at the rate of 110,000 barrels daily, having decreased to 58,509,000 barrels. That amount was 1,473,000 barrels or 2.6 percent more, however, than was on hand a year before.

Marketing Firm Dissolved, Sinclair Retains Employes

Effective December 21, Sinclair Prairie Oil Marketing Company was dissolved and assets and liabilities taken over by Sinclair Prairie Oil Company, the parent company. W. L. Connelly, chairman of the Sinclair Prairie companies, explained Sinclair Prairie Oil Marketing Company will become the crude oil marketing division of Sinclair Prairie Oil Company without any changes in personnel. All assets were transferred as of December 20, and all liabilities and unpaid accounts were assumed and will be paid by the Sinclair Prairie Oil Company, and all employes of the old marketing organization will go on the oil company payrolls.

Nelson K. Moody, president of the oil marketing firm, is on leave of absence due to illness and J. P. Moroney has been elected a vice president of Sinclair Prairie Oil Company and will have under his direct supervision all crude oil purchases in Kansas, Oklahoma, Texas and New Mexico.

A. S. Dent, formerly in charge of the division order department of the marketing organization will continue in the same capacity and A. V. Schumacher, formerly in charge of the same division at Fort Worth, Texas, will handle the same department there. Other officers of the old marketing organization who will continue to function under the oil company setup include A. B. Hookins, assistant secretary treasurer who will handle the fiscal affairs of the crude marketing division; M. F. Lobitz, continues as assistant treasurer of the oil company.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.
(All figures in thousands of barrels—add 000)

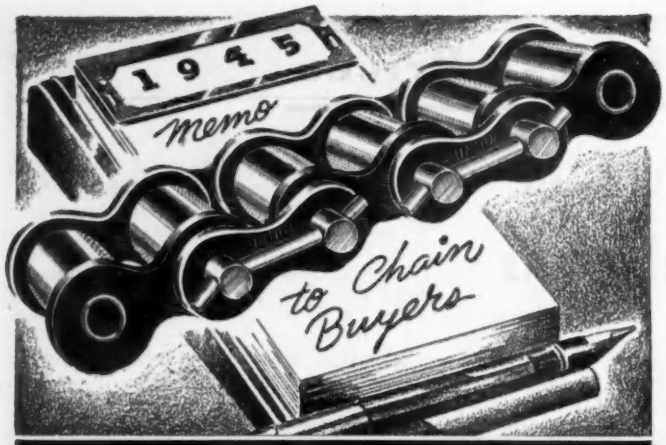
HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 3
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	[1]4,762	9-30	[1]4,775	9-30	240,992	1- 1	89,162	4- 1	48,863	10-28	64,644	10- 7
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	[4]220,623	9- 9	76,302	1- 1	30,232	4-29	49,737	3-18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,681
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	247,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,453	8,680	59,839
September 30	[1]4,762	[1]4,775	222,393	14,494	78,028	4,622	45,329	9,292	64,226
October 28	4,740	4,658	223,235	14,117	79,058	4,772	48,705	8,985	64,382
December 2	4,712	4,693	221,591	14,853	80,426	4,082	45,832	8,981	61,727
December 9	4,704	4,552	220,258	14,611	80,880	4,056	44,436	8,923	60,458
December 16	4,695	4,537	222,075	14,145	82,747	4,353	42,413	8,727	59,280
Dec. 23 1944	**4,729**	**4,682**	.....	**14,635**	**83,355**	**4,605**	**40,846**	**8,798**	**58,509**
Dec. 25, 1943	4,362	4,204	[5]241,795	12,576	73,019	4,411	43,033	8,697	57,036
Change:									
In week	+34	+145	+1,817	+490	+608	+252	−1,567	+71	−771
In year	+367	+478	−19,720	+2,059	+10,336	+194	−2,187	+101	+1,473
In year	+8.4%	+11 %	−8.2%	+16.4%	+14.2%	+4.4%	−5.1%	+1.2%	+2.6%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, December 18, 1943.



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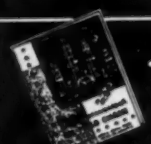

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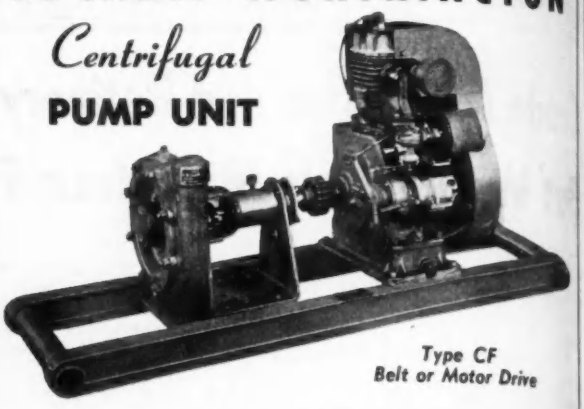

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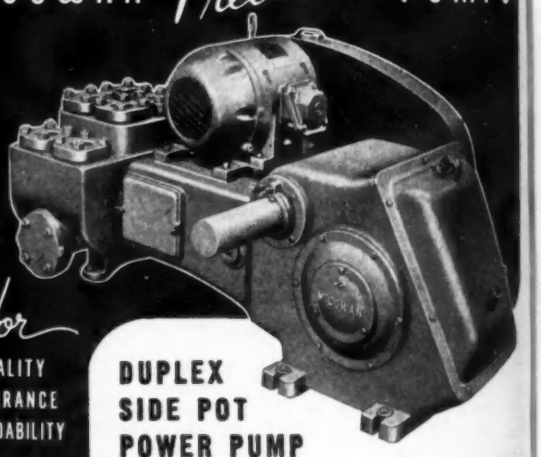

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U. S. Field Operations

Oklahoma

Important Oil Strikes Mark Year-End Drilling in State

Two important oil strikes mark year-end drilling; more wells completed in West Edmond area; royalties soar in Bethany area.

Cleveland County: O. G. Harp's Mattheson 1, NE NW NE 19-10n-2w, about 2 miles east of Moore, flowed an estimated 350 barrels of oil an hour following a drill stem test in Bartlesville sand at 7568-7607 feet. Pipe has been set and operator was preparing to test. The strike has skyrocketed lease and royalties between the discovery well and the old Moore pool. The wildcat was drilled on a 600-acre block and is the first Bartlesville sand production in the area. Helmerich & Payne, Inc., of Tulsa, are contractors, and the geology was worked out by William Graham of Tulsa, who acquires an interest in the production.

Kiowa County: In the Anadarko Basin along the northern rim of the geosyncline, The Pure Oil Company's Hinton 1, SE NE NW 10-7n-17w, north of the Hobart pool, was preparing to test after the well flowed 40-gravity oil on drill stem test in the Pontotoc sand of the Pennsylvanian series. At total depth of 1984 feet, drill stem test was taken at 1928-45 feet and when the tool was pulled it contained 1600 feet of oil.

West Edmond: Several new wells were completed or in course of completion. Gulf Oil Corporation's Christner 3, CSE SE 7-14n-4w, drilled to 7181 feet was waiting on cement. Gulf's Flynn 1, CSW SW 21-13n-4w, perforated with 52 shots in Bois d'Arc lime at 7010-22 feet, flowed 273 barrels of oil net in two hours. Magnolia Petroleum Company's Talbot 2, CNE NW 28-13n-4w, east offset to the south extension well, was preparing to test saturated Bois d'Arc lime. Cities Service Oil Company's Seyller 2, CNW SW 3-14n-4w, flowed 400 barrels of oil in 4 hours. O'Brien 4, CSE SE 4-14n-4w, flowed 80 barrels of oil an hour from Bois d'Arc topped at 6809 feet. Continental Oil Company's Sellyer 1, CSE SE 4-14n-4w, flowed 1097 barrels of oil and 1,260,000 feet of gas in 24 hours after perforating with 128 shots between 6565-6628 feet in Bois d'Arc. Sohio Petroleum Company's Lachenmaier 1, CSW NE 8-14n-4w, flowed 418 barrels of oil in 4 hours through perforations at 6688-6740 feet.

Logan County: F. C. Hall's Perdue 1, SE SE SW 24-19n-4w, possible Layton sand producer east of the Marshall pool, was preparing to shoot the sand section between 4862-72 feet to induce flow. On initial test the wildcat showed 100 feet of oil. Another new Layton sand producer in the North Crescent area was Phillips Petroleum Company's Cutter 1, C SE NW 36-18n-4w, flowing 400 barrels of oil per day after shooting between 4879-4885 feet. Phillips is starting Sheridan 1, C SW NE of 36.

Garvin County: Sohio Petroleum Company acquired control of C. L. Carlock's wildcat test and block west of the small Butterfly gas pool. The test, Blythe 1, NW C 29-1n-1e, has been shut down at 2614 feet. Sohio was reported paying $15,000 cash plus $25,000 in oil with Carlock retaining a 1/16th override.

Southeast of the East Pauls Valley pool Fox and Fox were rigging up an important wildcat, Powell 1, C NE NE 2-2n-2e, on a 2200-acre block for a 6500-foot Wilcox sand test.

Oklahoma County: Gulf Oil Corporation's Beck 1, C SW SW 15-14n-2e, east of the Northeast Edmond pool which reported an oil show in sandy dolomite topped at 6084 feet, recovered white sand with salty taste in a ninth core cut from 6086-96 feet. It cut Viola lime at 5946 feet and the Simpson at 5985 feet. Hunton lime was topped at 5755 feet and Sylvan shale at 5843 feet.

Seminole County: Sun Oil Company's Harbour 1, NE NE SE 34-10n-5e, near the Northwest Earlsboro pool, was abandoned after salt water in the Wilcox sand was recovered from 4616-37 feet. Test of Hunton lime at 4369-82 feet also recovered salt water.

Bethany Area: Kerlyn Oil Company's Classen 1, C NW SE 22-12n-4w, in western Oklahoma County, was drilling in broken dolomite below 7371 feet at last reports, with the first Wilcox sand believed near. Royalty within 2 miles of the well was sold for prices ranging from $500 to $750 an acre, as high as edge offerings at West Edmond, about 5 miles north.

Major County: With 100,000 acres of leases assembled in 1944, Superior Oil Company of California was starting work on Manning 1, NE NE NW 27-22n-10w, west of Ringwood, which will be a deep Ordovician test in the Anadarko Basin. It was due to resume drilling at Norris 1, NE NE NE 17-19n-10w, near Okeen in Blaine County, where big pipe was set at 2354 feet. Seismic crews still were shooting the big Major County block.

☆

THOMAS L. EASTHAM, material clerk in the Tulsa offices of The Carter Oil Company, left recently for Cuba, where he will establish a warehouse and train native personnel for Standard Oil Company of Cuba.

Wells Completed in United States in Week Ended December 30, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS: *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	1	33	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	6	5
Arkansas	2	1	....	1	4	....	....	1	2	3	7	7	233	254
California	28	....	....	1	29	....	....	....	3	3	32	....	2,008	1,474
Colorado	1	....	....	....	1	....	1	....	1	2	3	....	30	34
Florida	....	....	....	....	....	....	....	....	....	....	....	....	8	5
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	8	4
Illinois	29	....	....	12	41	2	2	1	7	10	53	51	2,097	1,859
Indiana	3	1	....	2	6	....	1	....	....	1	7	3	356	288
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	8	....	....	7	15	....	1	....	6	7	22	42	1,725	1,748
Kentucky	7	....	....	6	13	....	....	....	....	....	13	15	789	427
Louisiana	5	1	....	1	7	....	1	1	2	4	11	10	779	667
North Louisiana	1	1	....	....	2	....	1	1	2	4	6	4	286	319
South Louisiana	4	....	....	1	5	....	....	....	....	....	5	6	493	348
Michigan	....	....	....	3	3	....	1	....	8	9	12	16	688	604
Mississippi	2	1	....	....	3	....	....	....	....	....	3	4	213	97
Missouri	....	....	....	....	....	....	....	....	....	....	....	2	42	29
Montana	6	....	....	2	8	....	....	....	2	2	10	6	330	242
Nebraska	....	....	....	....	....	....	....	....	....	....	....	2	13	39
New Mexico	7	....	....	....	7	....	....	....	2	2	9	10	422	271
New York	15	....	10	....	25	....	....	....	....	....	25	25	1,263	1,241
Ohio	3	....	....	3	6	....	....	....	....	....	6	15	984	737
Oklahoma	29	1	1	6	37	....	....	....	6	6	43	47	1,921	1,466
Pennsylvania	27	6	15	....	48	....	....	....	....	....	48	53	3,047	2,530
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	9	6
Texas	69	3	2	24	98	1	1	2	12	15	114	132	6,188	4,370
E.Tex.Bor. Co.'s	....	....	....	....	....	....	....	....	....	....	....	2	35	18
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	4	5
Rest of E. Texas	3	....	....	1	4	....	1	....	2	3	7	2	280	255
North Texas	15	....	2	11	28	....	....	....	4	4	32	33	1,414	1,108
W. Central Tex	1	....	....	2	3	....	....	....	2	2	5	2	419	394
West Texas	29	....	....	....	29	1	....	....	....	....	30	38	1,647	971
Tex. Panhandle	2	2	....	....	4	....	....	....	....	....	4	15	295	202
G. Coast, Upper	7	....	....	3	10	....	....	1	1	2	12	11	612	337
G. Coast, Lower	11	1	....	2	14	....	....	1	....	1	15	18	924	641
Southwest Texas	1	....	....	5	6	....	....	....	2	2	8	10	453	372
S. Central Tex.	....	....	....	....	....	....	....	....	1	1	1	1	105	67
Utah	....	....	....	....	....	....	....	....	....	....	....	....	1	....
West Virginia	1	19	....	3	23	....	....	....	....	....	23	15	975	717
Wyoming	11	....	....	....	11	....	....	....	....	....	11	2	175	126
Total U. S.	253	33	28	71	385	3	8	5	51	64	452	458	24,345	19,245

* Includes distillate wells. † Includes salt water disposal wells.

Kansas

New Producing Area Near Smyres Pool Is Opened

Two new strikes and a new producing horizon in an established pool highlighted Kansas oil activities at the year-end.

In Pratt County, Sinclair Prairie Oil Company added the Arbuckle and the Skinner Northwest pool producing zones, heretofore limited to Viola production. Oldfather 1, CSE 7-31s-14w, filled up with oil after plug was drilled. Arbuckle was cut at 4554 feet, where pipe was set and well drilled to 4561 feet, total depth. Testing continues. Lion Oil Refining Company completed Allen 1, wildcat in NW NE NE 2-30s-14w, about 7 miles northwest of Lake City pool. The wildcat, which has been testing for several weeks, was finaled in Arbuckle, flowing about 2 barrels of oil an hour and 6,000,000 cubic feet of gas daily from 4515-17 feet.

Rice County: Nelson Drilling Company opened a new area 1½ miles northwest of the Smyres pool as Allison 1, NEc 23-19s-6w, pumped 15 barrels of oil daily with a trace of salt water from Mississippi lime topped at 3341 feet. Pipe was set at 3342 feet and hole drilled to 3384 feet, total depth.

Saline County: A possible pool opener was seen in Mouser Drilling Company's Carlin 1, NE NE SW 13-15s-3w, 4 miles southwest of the Salina field. With Viola topped at 3258 and casing set at 3505 feet, total depth, pipe was perforated with 18 shots opposite 3258-64 feet and on initial test swabbed 15 barrels of oil and 37 barrels of water in 24 hours. In 22 hours swabbing, fluid decreased to 2 barrels of fluid an hour, a third oil. Perforations were squeezed and casing reperforated with 56 shots between 3256-3323 feet and operator was acidizing for test.

Ellis County: At the south end of the Shutts pool Stanolind Oil & Gas Company reported good oil and gas shows in Bank 1, NW NE SW 28-12s-17w, in Arbuckle lime at 3645-46 feet where pipe was set for production test. Iron Drilling Company abandoned Plannensteil 1, NW NW NE 2-15s-18w, wildcat 2 miles northeast of the Leiker pool, after testing salt water in Arbuckle lime at 3666 feet.

Missouri

Claude McQueen's Patterson 1, CNW NE 14-64n-38w, second of 4 projected tests in the area and located in Nodaway County, is drilling below 657 feet. The wildcat is 4 miles west of Quitman.

Platte County: Lee Fox's Fee 1, SE SE SW 12-51n-35w, was shut down at 670 feet.

Jackson County: Peterson et al's Fee 1, CNE NE 34-49n-32w, wildcat southeast of the Blue Ridge gas pool, was dry and abandoned at 300 feet. Peterson has started drilling Fee 2, SW NE NE of the same section.

No Slackening Seen for 1945 Oklahoma Drilling

Year-end survey among Oklahoma oil operators indicates no slackening off of the vigorous drilling campaign which marked the last 12 months. West Edmond pool with 300 producers completed has at least 400 additional locations which will be drilled in 1945. Approximately 140 drilling blocks totalling 3,250,000 acres are scattered over 20 counties in northern and western Oklahoma, mostly in the vast, unedeveloped Anadarko Basin, and wildcats will be drilled ranging in depth from 1000 feet to below 15,000 feet.

Secondary recovery will receive an impetus because of the increasing demand for oil and much drilling will be done in old pools in efforts to develop new producing horizons.

New Mexico

Deep Permian Oil Area Is Opened in Lea County

Continental Oil Company et al's Skagg 2-B, C SW NW 23-20s-37e, and ⅞ mile southeast of Mountain field, opened a deep Permian oil area in Lea County in flowing 270 barrels of 42-gravity oil natural daily through ¾-inch choke from perforations at 7700-25 feet, having plugged back from granite at 10,465 feet. Production is reported from Wolf Camp, near base of Permian, and is the first commercial oil well in the Permian Basin from this zone, although it yields gas-distillate in the Mac-Der pool, Pecos County sector of West Texas.

Lea County: Stanolind Oil & Gas Company's State 1-P, NW NE NE 24-21s-34e, south edge of the West Eunice field, blew out at 3820 feet and flowed wild for several days at estimated rate of 500 barrels of pipe line oil hourly. The flow was killed with salt water injected under pressure. It is a south offset to Wilson Oil Company's State 13-B, which flowed 824 barrels initial from regular pay at 3770-78 feet.

Ohio Oil Company's Jones 1, eastern Lea County wildcat and 3¼ miles southeast of the Hobbs field, tested water with only a trace of oil when plugged back from 5779 to 5766 feet, and has resumed drilling. This prospect entered the Glorietta at 5630 feet with elevation of 3581 feet, and logged porosity at 5710-30 feet and saturation at 5750-70 feet.

The Texas Company's State 1-A-G, 2½ miles north of the northwest Vacuum field, landed protection string at 5523 feet, and was drilling sandy-lime at 6912 feet to explore the Clear Fork. Barney Cockburn et al's Wyatt 1, 1½ miles southeast of the Maljamar field and structurally low, was trying to reset 5½-inch pipe with packer to test oil shows in lime at 6670-6720 and 6900-60 feet. The hole is bottomed at 7020 feet, and fills 200 feet from surface with 37-gravity oil and some water after each swabbing.

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W. K. ESGEN, Gulf Coast Division manager of British-American Oil Producing Company, Houston, for two and one-half years, has resigned. He now is associated with L. V. Manry, a former partner, as consulting geologist, with offices at 503 Mellie Esperson Building, Houston.

HARRY B. COOKSTON, formerly with W. K. M. Company and Smaller War Plants Corporation, has joined Weatherford Spring Company, Weatherford, Texas, and is maintaining headquarters in Houston.

West Texas

Test Near Slaughter Field Gives Hockley New Pool

Hockley County gets new pool; Andrews County test logs effective pay in Devonian; Wheeler-Ellenburger well has good test in Silurian.

The Texas Company's Montgomery 1, 7 miles north of the Slaughter field, has uncovered a new pool for Hockley County, having swabbed and flowed 39 barrels of fluid, averaging 24 percent bottom sediment and acid residue, on 18-hour test after using 2000 gallons of acid in broken San Andres pay at 4751-4890 feet. The oil is lower in gravity than that produced in the Slaughter field, and the volume of gas is subnormal.

Andrews County: Mid-Continent Petroleum Corporation's University 1-11, 1850 feet southwest of its Devonian discovery for the Fullerton field, flowed 115 barrels, including 15 percent acid residue, per hour after using 1000 gallons of acid through perforations at 8450-8535 feet in Devonian, topped at 8408 feet. This confirmation test logged 157 feet of effective pay in the Devonian. Magnolia Petroleum Company's Ralph 1-A, west outpost for the north end of the field and a failure in the Devonian at 8114-8390 feet, was drilling lime at 8927 feet to explore the Ordovician. Stanolind Oil & Gas Company's University 1-D, wildcat, is due to make a drill stem test with broken oil saturation and stain logged in coring Ellenburger at 10,057-10,118 feet.

Winkler County: Sun Oil Company's Wheeler 1, southwest edge of the Wheeler-Ellenburger field, entered the Silurian at 9095 feet and tested 5760 feet of oil in addition to gas-cut mud when tester was used at 9163-9230 feet. This is the best performance for the Silurian, although other tests indicated possible production from this zone. In the Keystone-Ellenburger field, Continental Oil Company's Walton 1-D entered the Ellenburger at 10,180 feet, being 1022 feet low, and had failed to indicate production in drilling to 10,310 feet. Sinclair Prairie Oil Company's Walton 5-A, ¼ mile east, topped the Ellenburger at 9160 feet, and was perforating with pipe on bottom at 10,005 feet.

Lubbock County: Seaboard Oil Company and Stanolind Oil & Gas Company's Craven 1, 11½ miles north by west of the Nairn pool's Clear Fork discovery, fulfilled depth contract at 8800 feet in Pennsylvanian shale, and will plug back to try for completion in oil-saturated lime at 6066-83 feet. Magnolia Petroleum Company's Johnson 1, an Ellenburger project, was fishing for stuck drill pipe at 9424 feet, being 7 feet off bottom in shale, topped at 7355 feet. This wildcat entered the Pennsylvanian at 6540 feet. Norwalk Company's Nislar-Sun 1, Clear Fork prospect, was fishing for drill pipe at 5516 feet, having proved dry in the Slaughter field zone, topped at 4763 feet.

Pecos County: Magnolia Petroleum Company's Hart-State 1, 2 miles southwest of the Abell multi-pay field and more than 200 feet lower structurally than the nearest producer, drilled plugs from 5½-inch casing at 6023 feet and flowed a small volume of oil along with oil-load while idle for the holidays. This

production is from Waddell, Basal Simpson sand, topped at 6073 feet. The test was drilled to Ellenburger at 6465-6754 feet, then plugged back to 6100 feet. Phillips Petroleum Company's Price 1, second deepest test with hole bottomed at 15,279 feet, failed to respond to swabbing after using 250 gallons of acid through perforations at 11,495-11,525 feet. Perforations are due to be made at a lower level.

Upton County: Humble Oil & Refining Company's Parrott 1, prospective Clear Fork discovery, failed to make a commercial well from perforations between 7250 and 7575 feet, and will be deepened from 7750 feet. It was originally scheduled to drill to 11,000 feet, or water in Ellenburger. Magnolia Petroleum Company's American Republics 1 was drilling out cement after squeezing open hole at 7829-55 feet in black shale on account of cavings.

New Wildcats: American Republics Corporation is surveying its large Martin County block to drill F. Boehmke 1, near C NE NE T&P Ry., Sect. 34, Block 35, T-1-N. In Bailey County, the El Paso Natural Gas Company's West Texas Mortgage & Loan Company 1, near C SW SW Sect. 55, Block A, M.B.&B. Survey, will explore the Permian to 7000 feet, with a supporting block of 72,651 acres. Stanolind Oil & Gas Company and the Westbrook-Thompson Holding Corporation, joint owners of a large portion of the Hendrick field, Winkler County, have been assured a minimum of $100,000 in dry-hole money from other operators toward the drilling of an Ellenburger test in the field, which has not been explored below 4556 feet.

Tom Green County: The Texas Company's Garmon 1, third Ellenburger test for the county, was running tubing for swabbing test of 20-foot saturated zone after drilling plugs from 7-inch casing at 4910 feet. Top of Ellenburger was tentatively called at 4975 feet, and the hole was plugged back from 5504 feet to 5000 feet.

Crane County: Gulf Oil Corporation's Waddell et al 71-E, ¼-mile west of a prolific Ellenburger well in the northwest extension of the Sand Hills field, tested sulphur water in this deeper zone at 5825-49 feet, and has been plugged back to 4600 feet to complete in the Clear Fork. In the Crossett pool, The Texas Company's Hobbs 3-B, north outpost and new shallow pay strike for the Crossett pool, flowed 92 barrels of oil with 2 percent bottom sediment and water on 15-hour gauge through 18/64-inch choke after using 1000 gallons of mud acid through Holt zone perforations at 3190-3210 feet. However, the flow dropped below 2 barrels hourly towards end of test.

Ector County: Shell Oil Company and Cities Service Oil Company's T. P. Land Trust 1, a failure in Ellenburger at10,081 feet, plugged back to 8050 feet to perforate Upper Devonian after proving nonproductive from perforations at 8065-75 feet. The Texas Company's T. P. Land Trust 1-B, 4 miles southeast, was drilling Devonian chert at 8111 feet.

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GLEN SLEIGHT of Mt. Pleasant, resident geologist for Sun Oil Company, was elected chairman of the Michigan API chapter for 1945. He succeeds Walker Franks of the Gordon Oil Company, Mt. Pleasant.

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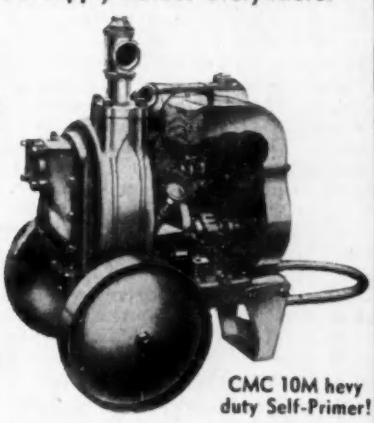

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INDUSTRIAL DIVISION
CONSTRUCTION MACHINERY CO.
WATERLOO, IOWA

Notice is hereby given that the State Mineral Lease Commission of Mississippi will meet in the office of the Governor of the State at Jackson, Mississippi, at ten o'clock A.M. on Monday, January 15, 1945, for the purpose of receiving proposals for the leasing of the Mississippi Sound and other tidal lands on the Mississippi Coast for oil and gas exploration. All parties interested in the development, exploration and leasing of all, or any part, of this area for oil and gas purposes are invited to submit in writing said proposals to the Commission at this meeting.

The property offered is described as follows:

The water bottoms in the Mississippi Sound, all bays, tributaries, estuaries thereto, also the marsh land owned by the State of Mississippi adjacent to the bays and sounds and the islands and submerged lands which are owned by the State of Mississippi in the Mississippi Sound and/or the Gulf of Mexico, estimated to contain more than 800,000 acres.

The Commission is primarily interested in a program of prompt and orderly development of this property for oil and gas and is not especially concerned in the matter of a commercial lease. The proposals submitted should outline the method and procedure to be followed in the exploration and development of this territory, setting forth in particular the care and caution to be taken in an effort to prevent damage to fish and fishing rights and incidental damage to other property, both private and public. The right is reserved to reject all proposals.

This the 19th day of December, 1944.

STATE MINERAL LEASE COMMISSION
By Greek L. Rice, Secretary

North Texas

Montague County Test May Make Well in Strawn Zone

Sinclair Prairie Oil Company's Foster 1, Sect. 179, Jose Olibarri Survey and a mile southeast of its Clinging Smith pool, Montague County, showed 50 feet of oil and gas-cut mud on drill stem test of Strawn saturation at 4620-37 feet, and was drilling shale at 5244 feet to explore the Bend series. The Strawn zone is expected to make a commercial well.

Ven-Mex Oil Company and Aro Equipment Company's Winsett 1, Jesse Davis Survey, has indicated a northeast extension for the Hildreth field, Montague County, with oil saturation in conglomerate at 6052-78, 6082-88 and 6110-24 feet. It is bottomed in water zone at 6248 feet. This outpost topped the Bend at 6030 feet.

Cooke County: The Texas Company's Beasley 1, ⅞-mile west by south of its Sivels Bend 6700-foot discovery pumper, cemented 5½-inch casing at 6898 feet to complete through perforations opposite deeper Strawn sand at 6826-42 feet. This confirmation test entered the discovery zone high, but it was barren.

Jack County: Paul P. Steed et al's Ware 1, ⅔-mile southwest of the Wolf pool's 4400-foot Bend oil discovery, entered the Bend at 4453 feet, being 37 feet low, and logged broken saturation to 4470 feet. A drill stem test yielded 40 feet of oil and 40 feet of oil-cut mud. Pipe will be set to try for completion. James Stewart and Company, Inc.'s Kinder 1-D, B. H. Epperson Survey and a 5500-foot Ellenburger prospect, resumed drilling after landing protection string of 7-inch at 4025 feet. This wildcat entered the Bend at 3843 feet, and tested 5 barrels oil daily at 3906-11 feet. Hanlon & Buchanan, Inc.'s Johnson Bros. 1-H, ⅓ mile north by east of the original deep strike for the county that was drilled by the old Roxana Petroleum Corporation, was drilling to 5250 feet to explore the Ellenburger after missing the 4500-foot pay.

Wilbarger County: Big Six Oil Company's Schlaffke-Morris 1-A, first Ordovician test for the Harrold field, tested a small show of oil and water from perforations in the lower part of the Ellenburger, topped at 4946 feet and drilled to 5146 feet. Acid treatment will follow, then perforations will be made in the upper zone.

Guadalupe Mountain Area Shown on U.S.G.S. Map

Publication of a new geologic map of the southern Guadalupe Mountains and the adjoining region in West Texas, has been announced by the United States Geological Survey, Department of the Interior, Washington, D. C.

This map is based on a study of the area by P. B. King and H. C. Fountain and represents an area of about 360 square miles in western Texas, immediately south of the New Mexico boundary, drawn on a scale of 4000 feet to the inch.

Guadalupe Peak (altitude 8751 feet), near the south end of the Guadalupe Mountains, is the highest point in Texas. The rocks of the cliffs and mountainsides below the peak and the surrounding region are consolidated marine sediments of Permian age belonging to the Leonard, Guadalupe, and Ochoa series, whose total exposed thickness is about 4000 feet. The distribution of the several formations in these series and of the overlying Quaternary deposits is shown on the map. The great lateral change in character of the rocks across the region is illustrated by a stratigraphic diagram that shows the abrupt change from the thick reef limestone formations of the mountains to the thinner formations of interbedded sandstone and limestone to the east.

An explanatory text, printed on the map, describes the stratigraphy of the Permian formations, the structural features of the area, the origin of the thick alluvial deposits of Quaternary age, and the evolution of the land forms.

Within the area shown on the map the Permian formations are probably not a likely source of oil or gas accumulations. The possibilities of older sedimentary rocks that underlie the Permian, however, are not yet determined.

The map, entitled "Geologic map of southern Guadalupe Mountains, Hudspeth and Culberson Counties, Texas," has been issued as Preliminary Map 18 of the Oil and Gas Investigations series. Copies may be purchased from the Geological Survey, Washington 25, D. C., at 40 cents each.

Tanker Contract

Award of a contract to the Marinship Corporation, Sausalito, California, for construction of four large tankers, to be delivered to the Navy in September and October of next year, was announced by the Maritime Commission December 13.

East Texas

Henderson County Given Its Third Producing Area

Lone Star Producing Company's Lee 1, B. C. Walters survey and 2½ miles north of Athens, established the third deep producing area in Henderson County on Christmas Day in flowing 10 to 12 barrels of fluid, estimated 75 percent oil and balance rotary mud, hourly while cleaning itself in pits. The gas volume was rated at 250,000 feet daily, and working pressure on casing and tubing was 2000 and 1350 pounds, respectively.

This production is from perforations at 8198-8208 feet in the Bacon, or upper Rodessa zone. Electrical formation survey recorded effective saturation at 8198-8203 and 8270-76 feet with elevation of 432 feet. The Opelika and Tri-Cities fields are primarily gas-distillate areas.

The Texas Company's Morse 1, Chandler prospect in eastern Henderson County, was drilling at 9725 feet after a drill stem test in Bacon zone at 9424-91 feet returned two stands of slightly gas-cut rotary mud with bottom-hole pressure dropping from 4900 to 1250 pounds. First porosity was logged at 9357-61 feet with elevation of 359 feet.

Gulf Oil Corporation's Frizzell 1, Baxter-Pine Grove area, logged first anhydrite at 9075 feet, and was drilling at 9070 feet.

Freestone County: The Texas Company's McKnight 1, I. H. Reed survey and 3 miles southwest of Fairfield, was logging fair to good gas-distillate shows in coring sands at 8395 feet. This wildcat recorded first porosity in the Travis Peak at 8232 feet, and indicated commercial gas-distillate production in several zones below.

Van Zandt County: The Texas Company's Stout 1, recent discovery in the Rodessa series, reduced its water yield in flowing 33 barrels of 44-gravity oil with 2 percent bottom sediment and water through 6/64-inch choke after plugging back from 8161 feet to 8157½ feet. Acid treatment is scheduled. Magnolia Petroleum Company's Phillips 1, north offset to the Fruitvale discovery pumper, pumped 122 barrels of oil in 48 hours from perforations in Travis Peak at 8594-8626 feet.

Wood County: Bobby Manziel et al's Johnston-Sun 1, Manziel field, flowed 137 barrels of water-white distillate daily through ¼-inch choke from Rodessa at 8396-8526 feet.

Cherokee County: W. H. Foster et al's Bowling 1, first deep test for the Lone Star pool, was swabbing live green oil and acid residue after reperforating the 7300-foot Rodessa zone then acidizing with 5000 gallons. A small producer is in prospect. This deep test has been idle for several months after failing to make a commercial well from 7340-88 feet. Humble Oil & Refining Company's Stanley 1, 3700 feet south by east of its Larissa pool discovery, was making a small amount of oil and gas while unloading to test perforations at 10,172-10,228 feet in Upper Pettit, and will be acidized.

Harrison County: Stanolind Oil & Gas Company and Continental Oil Company's J. S. Harris 1, wildcat 3 miles southeast of Woodlawn, was preparing to resume swabbing at latest report after having been shut down for two days. While swabbing to 1000 feet off bottom, casing being perforated at 6493-6520 feet, the well was making an estimated ½ barrel of 36.6-gravity oil with each pull of the swab and had not started showing formation water. Inasmuch as no water has been pulled in by swabbing, the operators probably will give the well another acid treatment in addition to the 1000 gallons with which it was acidized before it started testing. The formation is the Pettit, with casing perforated with 150 shots. Before treatment with acid it had shown gas only, and afterward started showing oil. While not yet a commercial producer, there is little doubt this well will lead to additional drilling in the area and possibly to discovery of a new oil field. Total depth is 6870 feet in Travis Peak topped at 6654 feet.

Panola County: McAlester Fuel Company's Hunt A-1, 6 miles southeast of Carthage, is still standing cemented at 9022 feet and setting a string of casing on bottom. Gas was found at various levels from 6284 feet to 7947 feet in the Travis Peak, but the most interesting feature is possibility of production from porosity in the Cotton Valley around 8360 and 8390 feet, much deeper than production of gas in the Carthage field.

Shelby County: Southport Petroleum Company's R. C. Poore 1, 4 miles northwest of Timpson, tested salt water after perforating in the Lower Pettit, and also in open hole between casing at 6701 feet and total depth of 6710 feet. It is now preparing to perforate for a test in the Upper Pettit section, where it had slight gas shows.

Southwest Texas

Two New Producers Added In Slick-Wilcox Field

The district had an unusually quiet week. A number of rigs were shut down for a day or so for the holidays, but these were not enough to account for the lack of important developments.

McMullen County: The Atlantic Refining Company's Sam Atkinson 1, deep test in Loma Alta field, trying for Wilcox production, is preparing to resume drilling below 9010 feet after having shut down for the holidays.

Humble Oil & Refining Company's E. M. Baker 1, deep test in the M. F. Lowe Survey, 17 miles southwest of George West and southwest of the San Caja area, is drilling below 8623 feet in hard sand and shale, in the lower Wilcox section.

Kleberg County: Tide Water Associated Oil Company's E. W. House 1, wildcat in the area 2 miles northeast of Ricardo, is drilling below 8240 feet in shale. This wildcat has had a few stringers of sand, shown on electric log, which seem to carry gas showings, but has had no real sand bodies, and has not make a drill stem test.

Sam E. Wilson's Robert Kleberg 1, wildcat in the area 3 miles southwest of Ricardo, which had been temporarily abandoned at 8359 feet, is preparing to resume drilling, going to an unannounced depth.

Brooks County: Humble Oil & Refining Company's Dan Sullivan 1, wildcat 8 miles southeast of the town of Falfurrias, which has made several drill stem tests between 7000 and 7216 feet, showing some condensate and gas, is drilling below 7312 feet in shale and sand, with no new tests attempted. A string of 9⅝-inch casing is set at 7117 feet.

Humble's Dan Sullivan B-1, another Brooks County wildcat, 8 miles southeast of the Sullivan 1, is drilling below 5800 feet in shale.

The new field opened by Standard Oil Company of Texas' Braulia G. de Garcia 4, has been given the name "East Alta Mesa" by the South Texas Geological Society. Its Garcia 5, second test in the new area, is now drilling below the 2426 feet of 13⅜-inch surface casing.

Victoria County: The East Telferner field will have a deep test in Bankhead Oil Company's Robertson 1, which is scheduled to 7500 feet. Location is 1250 feet southwesterly from W. V. Bowles' Robertson 1.

Kenedy County: Humble's Charles M. Armstrong 2, wildcat 1½ miles east of Armstrong in the La Berreta Grant, is drilling below 11,180 feet in shale and sand, having completed the original contract at 11,000 feet. It set a string of protection pipe at 8018 feet before drilling to present depth, but has not reported shows of oil or gas. This is the only active wildcat in the county.

Karnes County: Magnolia Petroleum Company's Russell-Atkinson 3, in the Green area, is drilling below 3950 feet in shale, scheduled to test the Wilcox, which is producing in the discovery well.

In the Burnell area, Stanolind Oil & Gas Company's Spielhagen 2 is drilling below 5810 feet in shale.

Lewis Lawlor's Gus A. Johnston 1,

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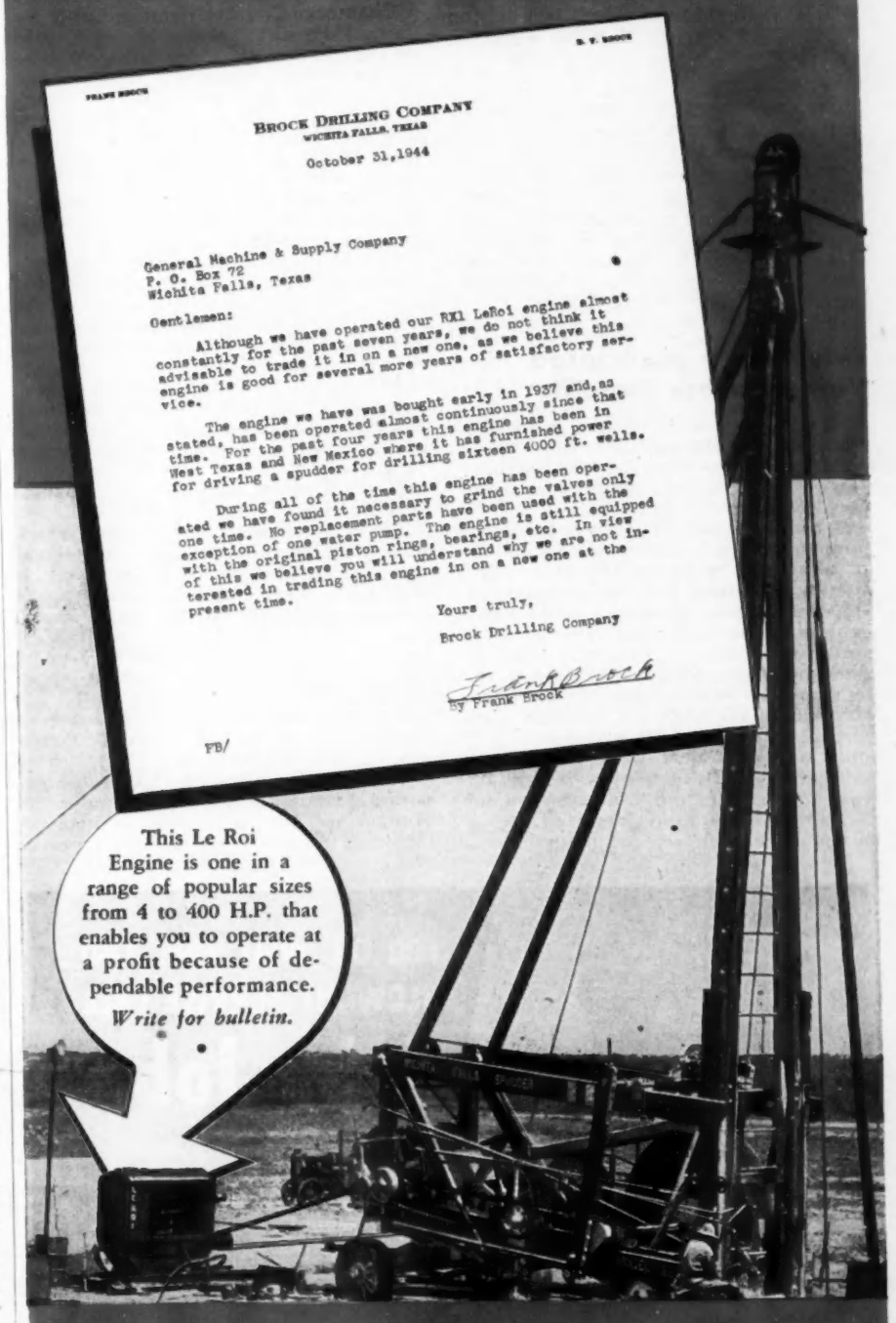

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WICHITA FALLS, TEXAS

October 31,1944

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Although we have operated our RXl LeRoi engine almost constantly for the past seven years, we do not think it advisable to trade it in on a new one, as we believe this engine is good for several more years of satisfactory service.

The engine we have was bought early in 1937 and,as stated, has been operated almost continuously since that time. For the past four years this engine has been in West Texas and New Mexico where it has furnished power for driving a spudder for drilling sixteen 4000 ft. wells.

During all of the time this engine has been operated we have found it necessary to grind the valves only one time. No replacement parts have been used with the exception of one water pump. The engine is still equipped with the original piston rings, bearings, etc. In view of this we believe you will understand why we are not interested in trading this engine in on a new one at the present time.

Yours truly,
Brock Drilling Company
by Frank Brock

FB/

This Le Roi Engine is one in a range of popular sizes from 4 to 400 H.P. that enables you to operate at a profit because of dependable performance.
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wildcat 5 miles southwest of Kenedy, is reported running electric log at 6250 feet, where it reached contract depth.

Southern Minerals Corporation's Joe Bartosch, testing in the Carrizo-Wilcox section, is still trying to make a well at 4652-55 feet, but is unable to get the water shut off. It was still making mostly water with a reported 25 percent oil.

DeWitt County: Rowan & Hope and Ray Ranger have made location for J. C. Wallis 1, 6500-foot wildcat test in the H. P. Cook Survey, 4 miles south of Westhoff, which has started setting up the rig.

Two new producers have been added in the Slick-Wilcox field with Superior's Mrs. A. Kerlick 1 being completed at 7639-43 feet, making 208.18 barrels of 35.1-gravity oil daily through a 10/64-inch choke, and Transwestern Oil Company's Poetter 4 making 183 barrels of 35-gravity oil daily through a 5/32-inch choke from perforations at 7596-7607 feet.

Tide Water Associated Votes Further Benefits

Directors of Tide Water Associated Oil Company during Christmas season voted to present each of the 1430 employes in the armed services an additional $50 war bond.

Benefits heretofore awarded by the company to each such employe include an allowance upon enlistment of $200 in cash if married or $100 if unmarried, $150 war bonds, a service credit equal to double the period of time spent in the armed forces in figuring retirement allowance for employes returning to the company and remaining until retirement, cancellation of debts for courtesy card purchases, payment of one year's premium on government life insurance policies purchased by employes on military leave of absence, and compensation for vacation if the employe received no vacation during the year of induction.

Texas Gulf Coast

Two New Fields in Harris, Chambers Counties Possible

Two new oil fields seem in prospect for the Texas Gulf Coast area, in addition to a new gas-condensate producing area, and indications of rapid development of a gas area in Wharton County.

Chambers County: Humble Oil & Refining Company's M. E. Mayes 1, wildcat in the Smith Point area, William Bryan Survey, is testing in Frio sand after having flowed 32 barrels hourly through a ¼-inch choke on initial tests. The well was drilled to 9994 feet before plugging back to the upper sands, and perforated casing at 8166-69 feet for a drill stem test preceding production test. It was brought in over Christmas weekend and tested for an hour after cleaning itself and has been shut in for potential test. Gravity of the oil tested 40.3 gravity and gas-oil ratio was 662-1. The rig probably will be moved to drill the company's Mayes 3, 1320 feet north of the discovery.

The Texas Company's White et al 1, wildcat in Section 137, 4 miles north of High Island in the southeastern corner of Chambers County, is drilling below 9100 feet.

Harris County: The Texas Company's Mrs. Madge Hopkins 1, wildcat in the Addicks area, west of Houston, which was swabbing oil last week, with indications it would have to be pumped, is flowing by heads, and has been turned into the tanks. It has not been gauged, and the flow is said to be small. Production is from perforations at 7702-08 feet, in a 6-foot oil sand section which showed 1800 feet of oil on a drill stem test. It had been swabbing for nearly a week before it kicked off and started flowing without agitation.

Wharton County: The Chicago Corporation has taken over operation of the Hungerford gas field after unitization involving other interested companies in the area, and has made locations for 4 new tests to develop this field as a gas reserve and a possible major source of supply for the Tennessee Gas and Transmission Company line to West Virginia. The new wells are all within approximately ¾ mile of Superior of California's discovery well. The discovery was completed in May from perforations at 3026-31 feet in a shallow sand, testing slightly more than 1,500,000 cubic feet of gas daily through a ¼-inch choke before being shut in to await a market.

Colorado County: Sinclair Prairie Oil Company's C. G. Glasscock 2, wildcat 5 miles north of Rock Island, has been completed from Wilcox sand through perforations at 9203-38 feet and 9274-80 feet, making 85 barrels of 51-gravity condensate plug 1,500,000 cubic feet of gas daily through a ⅛-inch choke to open another gas-condensate producing field for this county, which has become of constantly increasing importance since development of the first Wilcox production. Total depth is 10,518 feet with the 5½-inch casing at 10,300 feet.

Cities Service Oil Company may extend its Ramsey field ¾ mile southwest, having landed a string of 7-inch production pipe at 9025 feet, just 3 feet off bottom.

Pan American Production Company's Williams 1, wildcat 8 miles west of Eagle Lake, is drilling below 9097 feet after failing to show on a drill stem test of tight formation at 8916-47 feet. Recently it recovered condensate and gas on a drill stem test at 8372-90 feet in the upper part of the Wilcox.

Montgomery County: George W. Strake's Krohn W-1-B, in the western portion of the Conroe field, has reached 11,903 feet, just above the projected depth of 12,000 feet. No real showings of oil have been reported, although it had some good gas showings around 9400 feet.

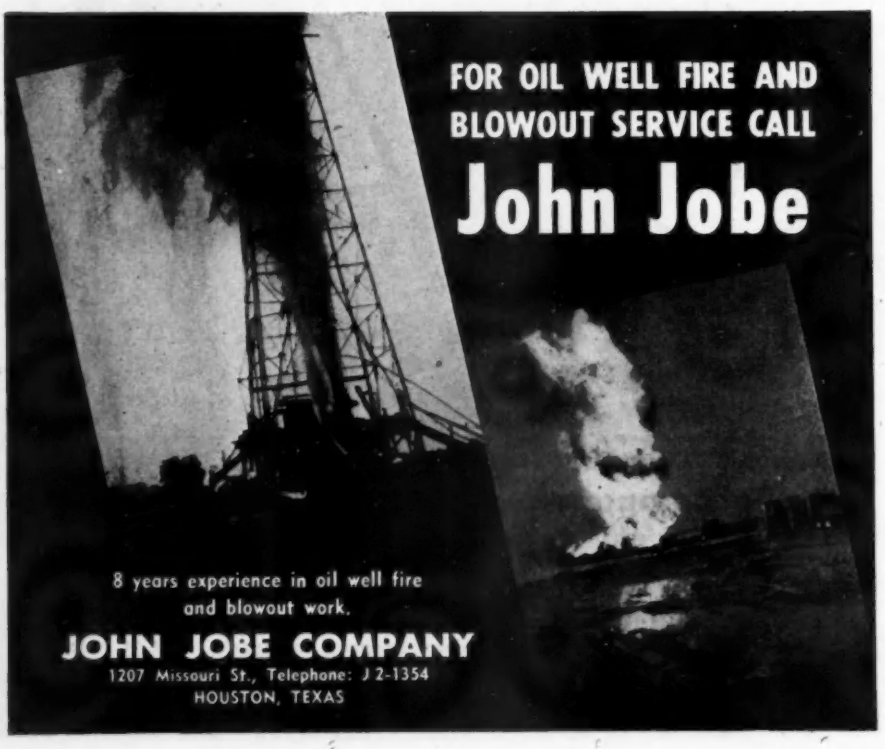
New Specification Book Is Published by ASTM

American Society for Testing Materials, 260 South Broad Street, Philadelphia 2, Pennsylvania, has published its latest compilation of all ASTM specifications, methods of tests, and definitions pertaining to petroleum products.

In addition to the current report of the society's committee responsible for most of the standards, there are certain proposed methods, for example, one on saponification number of petroleum by electrometric titration, proposed conversion tables for petroleum oils of metric tons to long tons and short tons, also a discussion on oil measurement, proposed methods of analyzing petroleum sulfonates, and a test for potential gum in aviation gasoline.

The large number of test methods provide authoritative procedures for determining properties of a wide range of petroleum products, for example, acid heat of gasoline, aniline point, burning quality of various products, carbon residue, color, distillation, specific gravity, knock characteristics of fuels, melting point, etc. Specifications are included covering fuel oils and gasoline, Stoddard solvent, various types of asphalt, etc.

This book, which includes the emergency method of test for color of Army motor fuel, and certain emergency provisions, can be obtained from ASTM headquarters at $2.75 each, with reduced prices on orders in quantity.



South Louisiana

Field Development Steady But Wildcatting Slackens

Although field development continues at a steady pace with as many rigs running as are available in the South Louisiana district, wildcat activity slackened. No wildcat completions were reported last week, and only one of 13 new locations was for a wildcat operation. Quick development seems assured for Barnsdall and associates' new West Tepetate field.

Acadia Parish: Danciger Oil & Refining Company has made location for Julius Frey 1, wildcat in northwestern Acadia Parish, 5 miles south of Eunice, in 40-7s-1w. It is to be drilled to 10,500 feet, with a company rig, and operations were scheduled to start soon.

In the Estherwood area, Sun Oil Company's Estherwood Townsite Unit 1, deep wildcat, is drilling below 10,852 feet, nearing its contract depth of 11,000 feet with no reported shows of enough importance for a test.

At Church Point, Continental Oil Company's L. D. Thibodeaux 1 is drilling below 10,100 feet in shale.

Jefferson Davis Parish: Since opening good oil pay horizons with the first 2 wells in the new West Tepetate field, Barnsdall Oil Company et al are apparently planning rapid development of the area. Locations were made last week for 2 tests in the new field. The operators' Fuselier 3 will be located in 38-7s-3w, a north offset to the Minos Miller 1, discovery well which produced from the 8500-foot sand. Minos Miller 3 will be a new test in the southwest quarter of 31-7s-3w, and will be 933 feet southeasterly from Miller 2, which opened the sand near 9200 feet. One well is to be drilled with a company rig, while the other is contracted to Falcon-Seaboard.

The latest completion, Miller 2, made 615 barrels daily through a 12/64-inch choke from perforations at 9168-80 feet, and the discovery well made 793 barrels daily through a ¼-inch choke from perforations at 8516-28 feet.

Meanwhile, Barnsdall Oil Company et al's Jos. Fuselier 2, northeast offset to the discovery well, is coring for the deeper sand, just below 9165 feet at latest report.

Union Sulphur Company's Wait 1, on the southeast flank of the Iowa field, is drilling below 5880 feet in shale.

St. Landry Parish: Sun Oil Company's C-1 Boagni is a new location made in the North Cankton field, scheduled to be drilled to 2825 feet for completion in the shallow 2800-foot gas sand discovered with Danciger Oil & Refining Company's Pothier 1. The new test is to be in 7-8s-3e, just northeast of the southeast corner of Section 12.

Sun Oil Company's B-3 Boagni, in the North Cankton area, has run electric log after drilling to 10,250 feet, has taken sidewall cores, and is running a string of 7-inch production pipe.

St. Mary Parish: Humble Oil & Refining Company has chalked up a failure in the Bayou Sale field, having abandoned its M. Wooster B-7 at 11,250 feet after running electric log and taking sidewall samples which did not indicate enough showing to warrant setting casing.

Evangeline Parish: Continental Oil Company's Pardee 5, outpost test in the Reddell area, is still standing cemented at total depth 9730 feet with casing landed on bottom.

Barling Resigns

J. F. Barling in charge of the materials section of the Tulsa office of PAW, District 2, has resigned effective January 1, and will resume his post with the Oil Well Supply Company at Houston. Barling has been connected with PAW in Chicago, Washington and Tulsa for two years. His department has been discontinued and all materials matters in the Tulsa area are now being handled out of Chicago.

Slaughter Wells Sold

R. Olsen Oil Company and Uscan Drilling Company of Oklahoma City, have sold four producing wells on 380 acres in the Slaughter pool of Hockley County in West Texas, to the Stanolind Oil & Gas Company for $590,000. Three of the producers are three years old and the fourth was only recently completed. All have daily allowables of 37 barrels. The deal also included all rights below 3500 feet on 1360 acres in the Humble-Leonard area of Lea County, New Mexico, near the Gulf Corporation's recent deep discovery well.

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KENNETH LYONS, scout for American Republics Corporation, at San Antonio, has been named land man in charge of the company's new Shreveport, Louisiana, office which will be opened after January 1.

North Louisiana

Two Gas-Distillate Fields Put on Completion List

Completion of two new gas-distillate fields and reports of showings in other wildcats highlighted drilling in the area.

Catahoula Parish: The California Company's Tensas Delta Monaghan Land Company 1, in 12-9n-7e, east of Harrisonburg, opens a gas-distillate area, having gauged 40 barrels of distillate along with 1,250,000 cubic feet of gas daily through a 3/16-inch choke with tubing pressure 1250 pounds. The casing had been landed at 8578 feet in this old, formerly abandoned wildcat, and perforated at 8512-44 feet for the test in the Massive sand section of the Tuscaloosa. Electric log had indicated the sand at 8512-73 feet.

The California Company has made location for H. C. Eckhardt 1 in the same section, and plans to drill to 9000 feet to test the sand section.

Red River Parish: The Texas Company's Semp Russ 1, wildcat which has made a number of tests in recent weeks after setting casing at 7173 feet, has made another production test at 5000-5020 feet which likely will be the point of final completion. It tested for a potential test of 20,000,000 cubic feet of gas daily on open flow with about 1 barrel of distillate per millionth cubic feet of gas showing, and continues testing through the same perforations. A number of tests previously made at various

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We founded this business, presumably, on the profit motive. That was 36 years ago. Government was by the people, and allowed them to keep most of what they earned. In other words the dog still wagged the tail. Our chief interest now is, perforce, in the friends we serve — supply and equipment buyers who TRY PELCO FIRST. Essentially their dollar buys no more here than elsewhere, but they get a better deal. It's in the air. We are old enough to remember that business was once an unmixed pleasure. Our service is not apathetic; it's hopeful, alert, interested. Men who serve you here are close to management, and vice versa. We aren't typical — but you'll enjoy the difference.

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levels in the Pettit formation have recovered gas and salt water. Location is in 16-12n-10w.

Magnolia Petroleum Company's J. C. Pickett 1, wildcat in 11-14n-10w, which had been scheduled to 6500 feet, has stopped at 3994 feet and is being abandoned after running electric log.

Natchitoches Parish: The California Company and Signal Oil Company's Annie Morrison 1, wildcat in the north part of the parish, is drilling below 4281 feet in shale with no confirmation by the operators of showings rumored to have been found around 4000 feet. It was reported the well found 30 feet of saturation in sand between 4000 and 4100 feet.

Richland Parish: C. W. Sharp et al's Cochran & Franklin 1, wildcat 4½ miles northwest of the new Sun Oil Company-C. H. Murphy discovery at Delhi, is drilling below 3140 feet, scheduled to 3400 feet, but probably will be abandoned at that depth after recovering salt water in two sections between 2955 and 3025 feet.

Roeser & Pendleton & Atlas Oil & Refining Company's Tensas Delta Land Company, another Richland Parish wildcat, is fishing for stuck drill stem at 4502 feet. Top of the Tuscaloosa red beds was picked up at 3655 feet.

A mile northwest of the discovery well at Delhi, H. L. Woods has set surface casing and is preparing to drill in Ellett Munholland 1, in the northeast quarter of 20-17n-9e.

Roy L. Fisher has set surface casing in Graham Unit 1, in 13-17n-9e, at Delhi townsite.

Sun Oil Company and C. H. Murphy have made location for Ella Barrier 1, ½ mile east of the discovery well, and also for a test southwest of the discovery in 21-17n-9e.

Arkansas

Deepest Clarksville Test Fails to Record Showings

State's activity declines; Clarksville area's deepest test plugged back after no shows found; producer added in Stephens field.

Johnson County: Arkansas-Louisiana Gas Company's S. M. Hudson Unit 1, deepest well to be drilled in the Clarksville area, shallow gas producing area in northern Arkansas, has been plugged back from 6110 feet after finding no shows below the regular pay horizons. Casing was perforated with 360 shots at 3400-30 and 3560-90 feet, and the well completed as a gasser, showing an open-flow potential of 3,500,000 cubic feet of gas daily.

Nevada County: Big West Drilling Company has set surface casing in its Pauline Mendenhall 1, in 1-14s-20w, wildcat 3 miles east of production in the Troy field, southeastern Nevada County, and is preparing to drill for a test of the Smackover. The well is in a badly faulted area, possibly in a graben.

Union County: Root Petroleum Company's Union Saw Mill Company 1, which had previously indicated opening of new Smackover lime production in the Strong area, is testing again after squeezing and reperforating, but is making mostly salt water. Flow from perforations at 6327-32 feet consists of 500 barrels of fluid daily, of which only 2 percent is oil, the rest salt water. When first brought in from perforations at 6320-30 feet, it had pumped 120 barrels daily, which declined within a week to 20 barrels daily, and then started showing salt water.

Columbia County: McAlester Fuel Company's Baker 1, a previously-abandoned well in the Magnolia field, now being reworked in an effort to make a producer, has pumped steadily for 4 weeks, making all salt water, but during the past week the water has shown a slight discoloration which was said to be increasing daily and may indicate that production may help salvage something from this old dry hole. The casing had been perforated at 5838-46 feet, 5812-19 feet, and 6228-34 feet, and McAlester officials' theory was that it may have stood so long that water has been forced well back into the formation and that enough oil may be produced to pay for pumping it.

In the Village field, Magnolia Petroleum Company is preparing to perforate casing for a test of Smackover lime around 7358-62 feet where oolitic lime showing oil had been cored. In the same field, Root Petroleum Company has abandoned B-1 Gunnels which found top of the Smackover at 7365 feet, too low to produce, and drilled to 7392 feet, where it is being abandoned.

A new producer was added in the Stephens field when Grady Vaughn completed his J. F. Smart D-3, pumping 250 barrels a day from perforations at 3885-3905 feet and open hole at 3920-25 feet. In the same field a test of R. H. Crow, Trustee's Smart B-2, showed production of 120 barrels of oil and 10 barrels of salt water in 24 hours, pumping. Casing was perforated at 3342-80 feet, 3762-67 feet, and 3848-54 feet.

USGS Planning Special Study of West Edmond

A special study of the West Edmond pool will be started soon by the United States Bureau of Mines. Preliminary conferences to determine the scope of the work were held recently in Oklahoma City between Glenn Stearns, engineer in charge of the West Edmond Field Engineering Association, and R. E. Hiethecker and Melvin N. Harlin, senior petroleum engineer and technologist of the bureau. Stearns plans to hold further conferences with West Edmond operators and the bureau engineers will again meet with him to determine what phases of activities will first be studied for the forthcoming report.

Shell Workers Honored

Shell Oil Company, Inc., honored 333 veteran employes of its New York head offices at a service award luncheon last week. It was attended by all Shell employes connected with the company for a period longer than ten years; and included Alexander Fraser, president, who this year completed his 25th year of service. L. T. Kittinger, vice president, and E. C. Peet, vice president and treasurer, have also completed 25 years with Shell.

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H. W. PENTERMAN, manager of the land department for the Shell Oil Company in the mid-continent area, has been promoted to executive assistant to Ralph Roark, vice president in charge of the area.

Southeastern

Mississippi Wildcatting Continues at Brisk Pace

Mississippi continues as one of the most active wildcatting areas in the South, and wells in widely separated parts of the state are finding showings of interest. In addition to recompletion of a discovery in Jefferson Davis County, a new strike is indicated in Clarke County, a possible gas field in Jasper County, and another in Issaquena County. Oil shows have been reported in a deep Marion County wildcat.

Jefferson Davis County: Gulf Refining Company's D. L. Mullins 1, opener of a new producing area 2½ miles southwest of the Gwinville discovery, was perforated at 9224-34 feet after perforations at this point had been squeezed in an effort to cut down the gas-oil ratio. On initial gauge it flowed 840 barrels of 40-gravity oil daily through a ¼-inch tubing choke with tubing pressure 2000 pounds and gas-oil ratio only 1860-1. It kicked off and started flowing after the swab was run only twice and cleaned itself quickly. This is much more encouraging than the Gwinville discovery itself, being a high-gravity oil producer. The Massive section of the Tuscaloosa has been proved productive in Mississippi of all types of petroleum from distillate to extremely low-gravity crude oil.

Clarke County: Kirby Petroleum Company's Long Bell Petroleum Company 1, wildcat in the southeastern corner of this eastern Mississippi county, was making preparations to rig up pumping equipment after having swabbed an estimated 100 barrels of oil daily on first test. It had perforated casing at 3650-60, 3707-17, and 3729-39 feet opposite sands in the Eutaw, and made a drill stem test recovering 2100 feet of low-gravity crude oil and no salt water. It is 10 miles northwest of production in the Gilbertown field of Choctaw County, Alabama.

A. B. Irion's Long Bell Minerals Corporation 3, wildcat in 14-2n-16w, is reported swabbing through perforations at 3755-73 and 3844-62 feet, in an effort to open Eutaw production, and is said to be recovering oil and some water.

Issaquena County: The California Company's Mississippi Alluvial Farms 1, wildcat 5 miles east of the Mississippi River in the northern part of the county, is drilling below 6078 feet in shale after reporting showings at 2 points in the Cotton Valley horizon, exact depths of which have not been given. Trading has been stimulated in the area, where California Company, Skelly Oil Company, and Sun Oil Company are the chief holders.

Jasper County: Gulf Refining Company's Edwards-Bailey Unit 1, wildcat on the Soso prospect in the southwest corner of Jasper County, is drilling below 7000 feet in sandy shale with no new showings reported below the gas-distillate at 6587-6630 feet, where a drill stem test at 6592-6650 feet recovered 12 feet of distillate, 158 feet of gas and distillate-cut mud, after it started flowing within 7 minutes. Sand is thought to be in the Eutaw horizon.

Sinclair-Wyoming Oil Company is preparing to start operations on W. A.

Bethea 1, wildcat in 12-1n-12e, 4 miles north of production in the Heidelberg field of Jasper County.

Marion County: Humble Oil & Refining Company's A. Evans 1, wildcat 9 miles southeast of Columbia on the southwest flank of the Lampton salt dome, is reported testing showings in the Tuscaloosa, with no real results reported. It made one attempt to test at 8957-60 feet which recovered nothing but gas-cut mud, and is preparing to test again. However, the reports were that the 5-foot section said to carry oil shows was logged at 8964-69 feet, in which case the test was made above the oil section.

Gulf Refining Company is drilling below 8000 feet in Bradshaw 3, wildcat in 29-3n-17w, with no shows found. It is scheduled to 8500 feet.

Adams County: The Pure Oil Company's McDowell 2, wildcat south of Natchez and southwest of the Cranfield field, is making a series of tests in the Tuscaloosa, none of which have been too encouraging. Latest test was with liner perforated at a point just below 10,317 feet, where it recovered salt water with an oil show. A squeeze job was run, after which it will perforate for another test, possibly in the section at 10,317-346 feet, where it was said to have had a good showing of oil.

Humble Oil & Refining Company's Stowers A-1, deep test in the northern part of Adams County, has drilled to 12,010 feet and is tearing down rig to abandon, apparently because none of the gas showings reported have been of commercial proportions.

Alabama

Hunt Oil Company's J. C. Bolinger 1, wildcat several miles southwest of the Gilbertown field in western Choctaw County, is drilling below 5030 feet, where it is well below the producing depth of the field. No showings have been found.

In the western part of the Gilbertown area, W. O. Woodward, Trustee's Mary Green 2 failed to flow after trying to complete at plugged-back depth of 3510 feet, and is waiting for pumping equipment. The 5½-inch casing is set at 3485 feet.

Clarke County: Bunte Oil Company et al's Chapman 1, wildcat in 30-9n-3e, is drilling at 3230 feet in shale with no details released.

Wilcox County: Southern Natural Gas Company's Fannie Stokes 1, in 32-12n-5e, is now below 2063 feet, drilling in shale.

Florida

The state has 6 wildcats on the active list but none was actually making hole this week. One is changing rigs at 3403 feet, in Collier County; another in the same area is still building roads to move in equipment; Humble Oil & Refining Company's wildcat in Dade County is shut down for repairs at 9093 feet, and the 3 other tests in the state are moving in, setting up, or preparing to spud.

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R. H. FIELDS, formerly with Continental Oil Company at Ponca City, Oklahoma, has joined Burt Treater Company representing the firm in Illinois, Indiana and Kentucky, with headquarters at Evansville, Indiana.

Metallizing Congress Scheduled This Month

A two-day congress of metallizers, maintenance men and supervisors interested in extending service life of equipment is scheduled for the Baker Hotel, Dallas, on January 15 and 16. The sessions will include practical discussions of various phases of metallizing by such well known authorities as Leo Hile, welding foreman, Phillips Petroleum Company, Borger, Texas; Floyd Patras, superintendent of maintenance, Southwestern Greyhound Lines, Dallas; E. C. Beach, metallizing department, Douglas Aircraft Corporation, Oklahoma City; John O. Wharton, National Welding & Grinding Company, Dallas; and Joe E. Young, Sr., General Metallizing & Machine Company, Houston.

In addition to the talks and general discussion, there will be presented a series of moving pictures on the uses and application of metallizing in various industries and in the service depots of the Army. There will also be exhibits of late developments in materials and equipment designed for metallizing.

The sessions will be held in the lounge of the Baker Hotel, with W. M. J. Huls, of Dallas, in charge.

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ARTHUR C. KENNAN, 46, secretary of the Wheeling Machine Products Company, Wheeling, West Virginia, died in Wheeling December 16. He had been associated with the company 25 years.

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3—7½ K. W. Flolite generators unitized with Hercules 4 cylinder motors, completely reconditioned.

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1—Link Belt complete with motor—V-Belts. Used very little.

ROTARIES

1—27½″ Emsco Oil bath, Model H, completely overhauled.
1—27½″ Ideco roller bearing completely overhauled.
1—New Hacker 12½″ all steel table bronze bearings with 3″ new square kelly—32′ large.

BLOWOUT PREVENTERS

2—13⅜″ Cameron, 3000-lb. Test, fluid operated, flanged, S.D.A., each.....$1500.00
1—13⅜″ Shaffer, 3000-lb. Test, with 4½″ and Blank Rams.....$1100.00
1—13⅜″ Cameron, 3000-lb. Test, manual operated, 4½″ Rams.....$ 750.00
2—16″ 3000-lb. Test Cameron Preventers, A-1 condition.....$1500.00
2—7″ Cameron Fluid Operated Tubing Preventers, 2″ and 2½″ Rams.....$ 475.00
1—7″ Reagan Tubing Preventer, new, with hydraulic pump.....$ 475.00

SPECIAL
Purchased in California

1—Wilson Titon Drawworks with 325 H.P. Wax motor model No. 6-L.R.H. in excellent condition and 1—350 H.P. Wilson Gas, Gasoline or Butane motor, completely overhauled, with Gear Box. This unit is ready for service.

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For Sale or Rental

25,000′ 7″ 20-lb. Range I 10 thread casing T. & C. No. 1.
25,000′ 5″ O.D. Range I 8 thread 18-lb. Line Pipe No. 1.
50,000′ 2″ 4.60-lb. Range I Tubing—T. & C.
70,000′ 2″ Plain Line Pipe—T. & C.
200,000′ ⅝″ Sucker Rods.
10,000′ 3½″ 6.70-lb. 8 thread Line Pipe—T. & C.
1000′ 10¾″ 40-lb. Range I Casing.

BOILERS

2—Lucey 108 H.P. 250 W.P. complete with all fittings, excellent condition.....$1500.00
1—Lucey 125 H.P. 250 W.P. complete with all fittings, dry bottom boiler.
2—125 H.P. 250 W.P. Donavons, each.....$1000.00

SWIVELS FOR DEEP DRILLING
Purchased in California

2—Emsco 300 ton, completely overhauled. Type C, late model.
1—Ideal 300 ton, completely overhauled. Type C-5.
2—Ideal 100 ton, Model GS, completely overhauled.
2—Oilwell 4″, completely overhauled.
1—6″ Gumbo-Buster, completely overhauled.
1—4″ Gumbo-Buster, late model.
1—Lucey 8″, completely overhauled.
2—Ideal Type A, excellent condition.

STEAM PUMPS

2—Wilson-Snyder 14 x 7¾ x 18 with Abercrombie steel ends. Mounted on steel skids, completely overhauled.....$4750.00
1—Wilson-Snyder 14 x 7¾ x 18 pumps, side suction, excellent condition. Late model, each.....$1650.00
1—Gardner-Denver 15 x 7¼ x 20, excellent condition.....$1500.00
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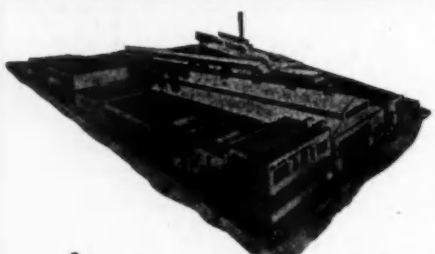

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TRADING POST SECTION
ON PAGE 68 OF THIS ISSUE

Illinois Basin

Hamilton County Test Is West End Pool Opener

West End pool of Hamilton County, Illinois, opened; North Calhoun test completed as discovery; Trumbull pool opened; Kentucky wildcat produces from McClosky lime.

Sinclair Wyoming Oil Company's Russell 1, SW SE SW 17-7s-7e, swabbed 425 barrels of oil in 24 hours from Cypress sand at 3130-50 feet after a 40-quart shot to open the West End pool of Hamilton County. In an earlier test the well swabbed only 175 barrels of oil in 24 hours.

Richland County: The Pure Oil Company and Ohio Oil Company's Koertge 1, NE NE NW 33-3n-0e, pumped 150 barrels of oil in 24 hours from Rosiclare at 3165-75 feet and McClosky lime at 3185-90 and 3195-3200 feet for completion as a discovery of the North Calhoun pool. The well was treated with 5000 gallons of acid.

White County: W. J. Lewis et al's Burkhardt 1, SE NE SW 18-5s-9e, wildcat test about 5 miles east of Carmi, has opened the Trumbull pool with production from the Cypress sand at 2840-55 feet. The well was given a 20-quart shot and then swabbed into production.

Douglas County: Ohio Oil Company's Shaw 1, SW SW SW 36-16n-6e, a rank wildcat test in an area held promising by the Illinois State Geological survey, is drilling below 4100 feet with cable tools. No worth while oil shows have been reported. Operators originally planned to carry the test to 6000 feet. However, it is now reported that the well probably will be abandoned before the drill reaches 4500 feet.

Franklin County: Weller-Randall et al's U. S. Coal and Coke Company 1, NW SW SW 14-5s-2e, in wildcat territory, has been completed in Aux Vases sand after a 60-quart shot. The well initially pumped 75 barrels of oil in 24 hours.

Kentucky

Sinclair Wyoming Oil Company's Humphrey 2, 6-P-21, a Henderson County wildcat, has opened the Burbank Chapel pool with production from McClosky lime at 2550-55 feet. The well swabbed 250 barrels of oil in 24 hours after 3000 gallons of acid.

Sun Acquiring Oil Rights Near Canadian Strike

Sun Oil Company of Philadelphia is acquiring oil rights to 500,000 thousand acres west of Standard Oil Company of California's Princess well strike.

This is Sun's first venture in Western Canada. The company is active in Nova Scotia.

Shell Drilling Wildcats In Magdalena, Colombia

Royal Dutch Shell interests, which hold about 2400 square kilometers of adjacent exploration-exploitation blocks in Central Magdalena, Colombia, are currently drilling 3 wildcats in the area in attempts to find better production potentials than have been developed in the Dificil field—in the middle block of the 3 areas held.

The third test in the San Angel block was spudded on November 14, and is now drilling. The No. 1 well was completed as a gas producer, furnishing fuel for the second and third operations. Well No. 2 was abandoned early in November as a dry hole, at a total depth of 4930 feet.

In El Doce block, south of Dificil, Shell is engaged in its fourth test, after three deep failures, put down more than 10,000 feet. The present Doce venture (Brillante No. 2) was drilling below 4500 feet at the end of November.

Richardson Will Join New Engineering Firm

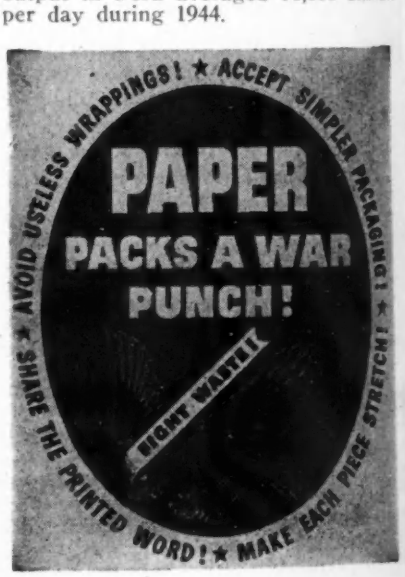
Frank E. Richardson, former manager of Pan-American Pipe Line Company, Houston, has resigned to become associated with the new firm of Foremen-Richardson-Baird, engineers and constructors specializing in design and construction of pipe lines and structures related to natural gas and petroleum industries, water works, sewers and public utilities. The location of the new company will be at 20 West 9th Street, Kansas City, Missouri.

Frank E. Richardson

Richardson has been associated with the oil industry since 1913, and has had a varied experience. He was chief engineer for the Great Lakes Pipe Line Company before joining Pan-American in 1936.

Firm Using 20 Rigs in Northwestern Peru Area

International Petroleum Company is employing 20 rigs in field development operations in the Parina Point area of northwestern Peru, where the company has more than 2000 producing wells, chiefly in the La Brea-Parinas pools. Proved acreage of International's extensive Peruvian holdings is now approximately 21,000 acres. The company's total output in Peru averaged 31,000 barrels per day during 1944.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Rocky Mountain Area

Wildcat at Bailey Dome, Wyoming, Finds Saturation

Wyoming wildcat drills into saturation; Powder River, Wyoming, test failure in Madison; two Colorado fields extended.

Bailey Dome: Sinclair Wyoming Oil Company's wildcat test of Bailey dome, Carbon County, Wyoming, Coffman 1 in SE NE NE 21-26n-89w, drilled into the Sundance at 5098 feet and on drill stem test at 5128-5176 feet, open 45 minutes, yielded 1500 feet of oil-cut mud. A second test at 5160-5206 feet, open 45 minutes, recovered approximately 35 barrels of 34.6-gravity oil per hour. The well is drilling for the Tensleep at 5229 feet.

Powder River Station: Stanolind Oil & Gas Company's LaFleiche 1, NE NE SE 23-36n-83w, Powder River Station, Natrona County, Wyoming, on drill stem test in the Madison at 4826-4889 feet, total depth, open 29 minutes, flowed water in 19 minutes and was plugged back to 3028 feet. Casing was perforated opposite the Sundance at 2489-2509 feet and the well tested 4,800,000 cubic feet of gas per day. The well will be tested further before completion.

Ft. Collins: Ft. Collins Producing Corporation's Community 1, C SE NE 18-8n-68w, approximately ¾ mile north of production in the old Ft. Collins field, Larimer County, Colorado, is swabbing at the rate of 75 barrels of oil per day from the Muddy sand at 4724-4749 feet. The well was plugged back to 4749 feet from 4759 feet after encountering water in the bottom 9 feet of sand. The 7-inch production string was cemented on top of the Muddy at 4724 feet.

Powder Wash: Mountain Fuel Supply Company's Stewart 2, SE SE NE 32-12n-97w, about ½ mile northeast and southeast of the nearest oil production in the Powder Wash field, Moffat County, Colorado, tested 1505 barrels of oil per day from a sand lens in the Wasatch at 4190-4216 feet. The well was completed in November for an estimated 20 barrels of oil per day and 5,000,000 cubic feet of gas from a sand in the lower section of the formation, but continued testing.

Addressed by Standley

Admiral William Harrison Standley, former United States ambassador to Russia, addressed 400 employes of Foote Brothers Gear and Machine Corporation, at Chicago, recently. Demands of the Russian people for consumer goods will become effective immediately upon the restoration of peace, but rehabilitation will delay the fulfillment of those needs, he said.

William A. Barr, president of Foote Brothers, outlined future plans of the company.

Corrosion Reprint

The Cochrane Corporation, Philadelphia 32, Pennsylvania, has issued Reprint No. 36 describing the application and general design of pipe lines, heat exchange equipment, cold, water deaerators, etc., to prevent corrosion.

IPAA Executive Committee Meeting Set by President

A meeting of the executive committee and state vice presidents of the Independent Petroleum Association of America at the Biltmore hotel, Oklahoma City, on January 29 and 30, has been scheduled by Ralph T. Zook, president.

"The need for this meeting is urgent in view of the many recent developments pertaining to the domestic oil industry," Zook said.

Among items to be discussed are: The developments and next steps in the crude price situation; revisions in the Anglo-American petroleum agreement; proposals of the National Planning association regarding imports of oil; informing the new Congress on the problems of the domestic oil industry.

Casper-Welch, Wyoming, Pipe Line Is Completed

Stanolind Pipe Line Company's cut-off line between Casper and Welch in the Elk Basin area, Wyoming, is now complete and running oil to Casper. The line consists of approximately 32 miles of 12-inch pipe replacing a line which formerly extended from Salt Creek to Welch. This link marks completion of Stanolind Pipe Line's project, which included laying 232 miles of 12-inch from Elk Basin to Casper.

Pullman Firm to Acquire M. W. Kellogg Interests

Pullman Incorporated will acquire for cash, with price to be determined, the entire outstanding stock of The M. W. Kellogg Company of Jersey City, New Jersey, long a leading firm in the field of petroleum and chemical engineering. M. W. Kellogg has been elected a member of the board of directors of Pullman Incorporated. The Kellogg company will be operated as a separately incorporated member of the Pullman group of companies, it was announced.

Marsh Buggy Movie

The marsh buggy, amphibious vehicle which looks like a cross between a tractor, barge, and a jeep, is being featured in the movies and will be seen by between 35 and 50 million people within the next few months. One of the "Popular Science" films is soon to feature Gulf Oil Corporation's marsh buggies in operation in the Louisiana marshes.

Shots taken in the Louisiana marshes, at the Bayou Couba oil field southwest of New Orleans, at the research laboratories of the Gulf Research & Development Company at Harmarville, Pennsylvania, near Pittsburgh, Pennsylvania, and at the Paloma oil field in southern California, will be shown in the picture.

Stock Exchanged

The Texas Company has acquired control of light oil production in the LaBarge pool in Lincoln and Sublette Counties of western Wyoming by exchanging 5564 shares of its stock for 100,000 shares of the stock of the Marvel Oil Company of Kemmerer, Wyoming. Marvel has 13 wells producing 212 barrels of oil daily while The Texas Company has 95 wells producing 1111 barrels of oil daily.

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TECTONIC MAP of the UNITED STATES 1944

Prepared under the Direction of the Committee on Tectonics, Division of Geology and Geography, National Research Council.
Chester R. Longwell, Chairman, Philip B. King, Vice-Chairman.
Charles H. Behre, Walter H. Bucher, Eugene Callaghan, D. F. Hewett, G. Marshall Kay, Eleanora B. Knopf, A. I. Levorsen, T. S. Lovering, George R. Mansfield, Watson H. Monroe, J. T. Pardee, Ralph D. Reed, George W. Stose, W. T. Thom, Jr., A. C. Waters, Eldred D. Wilson, A. O. Woodford.

A NEW GEOLOGIC MAP OF THE UNITED STATES AND ADJACENT PARTS OF CANADA AND MEXICO

Geologic structure, as evidenced and interpreted by a combination of outcropping areas, bedrock, surface disturbance, and subsurface deformation, is indicated by colors, symbols, contours, and descriptive explanation. Igneous, metamorphic, and selected areas of sedimentary rock are mapped. Salt domes, crypto-volcanic disturbances, and submarine contours are shown. The base map shows state boundaries, rivers, a pattern of cities, and 1-degree lines of latitude and longitude.
The scale is 1:2,500,000, or 1 inch equals 40 miles. Printed in 7 colors, on 2 sheets, each about 40 x 50 inches. Full map size is about 80 x 50 inches.

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California

Tideland Test Expectd To Open Producing Area

Beloil Corporation has logged sufficient showing in Hickey-State 1, tideland test west of the Rincon field, to practically assure a producer and open up a producing area. Drilled to 3628 feet, casing has been cemented at 3600 feet for a test of 20 feet of Miley Zone oil sand. Surface location of the well is in 7-3-24 and drilling angle of 65 degrees was necessary to reach the objective under the ocean.

Notices for 2142 wells had been filed on December 9, as compared to 1580 at the same date in 1943. Abandonments were 526, and for the year before, 487.

Kern County: Harry H. Magee, operator, Amalgamated-Happold 2, southeast of Trico gas field, was trying to salvage 7-inch casing cemented at 10,200 feet before abandoning. Drilled to approximately 11,200 feet, the Olcese, upper Vedder and lower Vedder tested wet.

General Petroleum Corporation's Kernlandia 84-16, extension test of the Fruitvale field, has 6⅝-inch casing standing cemented at 3995 feet for a test of Chanac showings. Depth is 8117 feet in gray sand. Top of Rio Bravo was placed at 7933 feet and top of Vedder at 8012 feet.

Rothschild Oil Company's McDevitt 1, 24-25-27 in the Pasmine area, was abandoned December 15 at 2325 feet in granite.

Santa Barbara County: Pacific Lighting Corporation completed Miller 2 in the Goleta gas field, 20-4-28, flowing through the casing at a 128,000,000 cubic foot rate. After a flow test the well was shut in with pressures of 1776 pounds tubing and 1776 pounds casing. Under normal production procedure the wells are allowed to flow 15,000,000 cubic feet daily. This will be the last well drilled.

Stanislaus County: Continental and Gulf Azevedo Comm. 1 in 27-4-7, on a formation test of the interval 4972-5010 feet recovered fresh water. The bottom will be plugged for further testing.

Important Wyoming Tests Shown on U.S.G.S. Map

The Geological Survey has issued another—No. 19—of its preliminary maps of the oil and gas investigations series, showing the locations of about 1400 test wells drilled for oil and gas that lie outside of known productive fields in Wyoming.

Most of the important tests up to September, 1944, are located, including many of the early unproductive wildcat tests, and the well symbols show whether the drilling resulted in dry holes, shows of oil or gas, or shut-in or abandoned wells. The total depth of the hole is given for most of the wells. Producing wells and dry holes that were drilled within oil or gas fields are not shown.

In addition to the more significant wildcat tests, the map shows the names and locations of 250 anticlinal axes, the location of all oil and gas fields that have been or are now productive, and a list of 422 wells for which data regarding location, well name, date drilled, surface formation and oldest formation penetrated are given.

"The information that has been assembled into map form should be of material aid in the search for new oil fields to supply increasing war demands, for the geologist in his search for new sources of supply is guided by the accumulated experience of the past," the service said in announcing the map.

Heavy Duty Truck Tire Survey Now Being Made

The ODT has put under way a survey to determine the number of heavy duty truck tires required to put all idle highway tank trucks to work and keep those now in operation working 130 hours a week.

In a request for information on this point, sent to over-the-road operators, Transportation Director J. M. Johnson emphasized the seriousness of the situation but offered no hope of its improvement for some time to come.

Because of the strain on all types of transportation, Johnson disclosed, there will be no relaxation in the prohibition against the use of tank cars without permit on hauls of less than 200 miles until after the defeat of Germany.

Johnson told the operators that the ODT will attempt to see that all operative trucks are kept on the road until the emergency ends.

☆

FRED COLLETT, former Oklahoma City representative for Continental Supply Company, has been transferred to Wichita to manage the district offices and take charge of Kansas sales. He is succeeded in Oklahoma City by Roy Ball.

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Phillips arranged through Lowell C. Brown of Oklahoma University for a 72-hour safety engineering course, and with G. M. Kintz of the U. S. Bureau of Mines for the bureau's 20-hour gas course.

Dividing the school into two six-day sessions allowed the trainees a breathing spell and an opportunity to digest new information. It also permitted the attendance of employes who could not have attended otherwise because of job responsibilities. Six hours of classes were conducted for six days during each of the two sessions, but in reality a total of nearly 90 hours were spent in classes because of student interest.

Class instructors were some of the industry's outstanding safety engineers and experts in related fields.

They included: H. W. Boggess, Sinclair Prairie Oil Company; D. A. Klemme, Stanolind Oil & Gas Company; E. D. Murphey, Mid-Continent Petroleum Corporation; R. S. Huffman, Oklahoma Natural Gas Company; H. H. Goff, Mistletoe Express Company; G. M. Kintz, U. S. Bureau of Mines; H. F. Browne, U. S. Bureau of Mines; R. D. Bradford, U. S. Bureau of Mines; A. A. Munsch, U. S. Bureau of Mines; H. W. Richards, Mine Safety Appliances Company; W. G. Engel, American Optical Company, and James A. Harte, American La-France Foamite Corporation.

California Association Names Officers for Year

California Oil and Gas Association, with headquarters in Los Angeles, has elected officers for the coming year as follows: Ralph B. Lloyd, president of Lloyd Corporation, Ltd., president; William Reinhardt, vice president, Union Pacific Railroad Company, and C. A. Johnson, president, Holly Development Company, vice president; John B. Sutherland, division manager, Ohio Oil Company, treasurer; Don E. Gilman, executive vice president; D. S. Kilgour, secretary; and George Prussing, technical secretary.

Hearing on Oklahoma Oil And Gas Rules Postponed

Hearing on the adoption of new rules and regulations to govern oil and gas production practices in Oklahoma has been postponed until January 24, after rules as proposed at a hearing December 21, developed vigorous opposition on the part of a group of operators. This is the third postponement. Regulations have been under consideration for months by special committees and it is possible the committees will hold another conference before the next hearing to iron out differences.

U. S. Exploratory Completions

ARKANSAS WILDCATS

Johnson County — Gas Discovery: Ark-La Gas Co.'s S. M. Hudson Unit 1, ne/4 15-10n-24w, perf 3400-90 & 3560-90 ft, flow 3,500,000 cu ft gas day, td 6110 ft.

Union County—Failures: Lion Oil Ref. Co.'s Mill 1, cent nw se 34-18s-14w, gas odor 7363 ft, abnd 7414 ft.

Kerlyn Oil Co.'s Crossett Lbr. Co. 1, sw sw nw 9-19s-10w, show oil 4260-64 ft, abnd 5415 ft.

CALIFORNIA WILDCATS

Colusa County—Failure: Standard Oil Co.'s Torres 1, lot 154 Sec. 12-18-2, gas test drill stem test 2910-80 ft, rec mud Capay shale 1810 ft, abnd 5322 ft.

Fresno County—Failure: British-Amer. Oil Prod. Co.'s Mahoney 1, sw se 6-17-17, Temblor 6485 ft, Kreyenhagen 8183 ft, Eocene sand pinched out, abnd 8853 ft.

Kern County—Failure: Standard Oil Co.'s Brittian Trustee 61-2, nw ne 2-30-26, Rio Bravo 10,901 ft, Grit 10,226 ft, Vedder 10,932 ft, abnd 11,009 ft.

COLORADO WILDCATS

Archuleta County—Failure: L. R. Travis' Davis 1, sw sw ne 18-33n-1e, Boone Dome, wtr in Dakota, abnd 2225 ft.

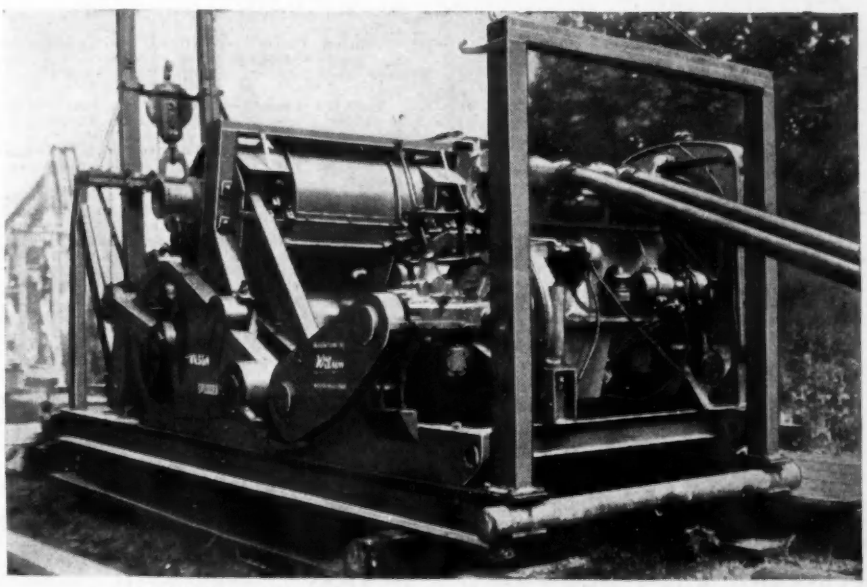
Rio Blanco County—Extension: California Co.'s McLaughlin-Gov't 1, c se nw 24-2n-103w, Rangely field northwest extension, flowed 344 bo 23 hr, Weber 5960 ft, td 6450 ft.

ILLINOIS WILDCATS

Clinton County—Failure: Texas Co.'s Buchne 1, nw ne sw 22-3n-4w, abnd 1181 ft.

Gallatin County—Failure: Sinclair Wyoming's Hines 1, se se nw 3-9s-10e, abnd 3001 ft.

Hamilton County—Failure: A. K. Swann et al's Hedges 1, nw nw ne 17-7s-5e, abnd 3422 ft.



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Jasper County—Gas Discovery: Ralph Willis et al's Fitzpatrick 1, sw sw ne 10-6n-11w, flow 500,000 feet gas daily, Robinson sd 825-35 ft, td 3040 ft.

Jefferson County—Failure: Sinclair Wyoming's Hanes 1, nw se ne 21-3s-4e, abnd 3175 ft.

Jefferson County—Oil Discovery: Texas Co.'s Inland Steel Co. 1, se sw sw 25-4s-1e, pump 53 bbls oil daily, Ben sd 2762-76 ft, td 3012 ft.

Marion County — Failure: Howard Johnson et al's Hill 1, se ne se 30-3n-1e, abnd 1605 ft.

Richland County—Failure: Dee Miller Drlg. et al's Atkins 1, se se sw 22-3n-4w, abnd 3160 ft.

Wabash County—Oil Discovery: Paul Greauling et al's Case 1, se se nw 36-2n-12w, pump 5 bbls oil day, Biehl sd 1745-61 ft, td 2630 ft.

Williamson County—Failure: J. R. Browning et al's Hayton 1, nw nw se 32-9s-1e, abnd 2060 ft.

INDIANA WILDCAT

Laporte County—Oil Discovery: J. H. Barton's Fischer 1, se ne 19-37n-2w, pump 5 bbls oil day, Dev 448-58 ft, td 460 ft.

KANSAS WILDCATS

Barber County—Failure: Huber & Vickers' Mauch 1, sw nw ne 8-31s-10w, Miss 4506 ft, Arb 4940 ft, abnd 5000 ft.

Barton County — Failure: Black-Marshall's Thompson 1, nwc 6-17s-12w, Lans 3205 ft, Arb 3452 ft, abnd 3457 ft.

Cowley County — Failure: Atlantic Oil's Evans 1, c w½ sw se 11-35s-6e, Miss 3017 ft, Arb 3515 ft, abnd 3515 ft.

Ellis County — Failure: Bridgeport et al's Sessin 1-A, se sw se 15-11s-19w, abnd 3507 ft.

Rice County—Discovery: Nelson Drlg.'s Allison 1, nec 23-19s-6w, pump 15 bbls oil and wtr day, Miss chert 3341-46 ft, td 3304 ft.

Rice County—Failure: Ed Swearer et al's Burns 1, nwc sw 6-21s-10w, Lans 3012 ft, Arb 3378 ft, abnd 3405 ft.

Stafford County—Failure: Lion Oil's Garner 1, nw sw sw 17-25s-13w, Miss 4078 ft, abnd 4302 ft.

KENTUCKY WILDCATS

Daviess County — Failure: Sohio's Bell 1, 8-P-31, abnd 1492 ft.

Henderson County — Oil Discovery: W. F. Lacey's Williams 1, 4-Q-20, pump 23 bbls oil day, Aux Vases 2596-2612 ft, O'Hara 2621-26 ft, td 2626 ft.

Ohio County — Failure: Jewell Resnick's Brown 1, 7-I-32, abnd 1718 ft.

Ohio County — Failure: Sinclair Prairie's Baunard 1, 21-L-32, abnd 1530 ft.

Webster County—Failure: Sinclair Prairie's Bozarth 1, 24-M-22, abnd 3320 ft.

NORTH LOUISIANA WILDCATS

Caldwell Parish — Failure: Atlantic Refg. Co.'s Louisiana Central Oil & Gas Co. B-1, 5-11n-3e, abnd 5050 ft.

Catahoula Parish—Gas-Distillate Discovery: California Co.'s Tensas Delta Monaghan Land Co. 1, perf 8512-44 ft, flow 40 bbls dist & 1,250,000 cu ft gas day, 3/16-in choke, td 9216 ft.

Catahoula Parish—Failure: Sinclair Prairie Oil Co.'s Webb 1, ne ne nw 10-8n-5e, abnd 5650 ft.

Claiborne Parish — Haynesville Field New Pay: Ohio Oil Co.'s Taylor P-1, perf 8910-20 ft and 8835-75 ft, flow 429 bbls day ¼-in choke 44.3-gravity oil, TP 100, CP 1450 lbs, td 11,270 ft, plugged back to 9041 ft.

MICHIGAN WILDCATS

Allegan County — Failure: C. W. Cook's Thomas 1, ne ne nw 20-2n-13w, Traverse lime, abnd 1345 ft.

Wayland Field Discovery: Raymond Donnersberger's Krubee 1, sw se ne 8-3n-11w, Traverse 1797 ft, pump and flow 35 bbls, td 1806 ft.

Clinton County — Failure: Wadsworth and McClure's O'Connell 1, se sw se 4-8n-4w, Traverse lime 2630 ft, Dundee lime 3009 ft, abnd 3121 ft.

Isabella County—Failure: Gordon Oil Co.'s Schaffer 1, se se sw 21-15n-5w, Dundee lime 3765 ft, abnd 3776 ft.

Missaukee County—Failure: Pure's Dorland 1, n½ se nw 9-21n-8w, Dundee lime, abnd 4065 ft.

Montcalm County—Failure: Sun's Martens 1, se nw nw 36-11n-8w, Stray sand, abnd 1186 ft.

Muskegon County—Failure: Muskegon Development Co.'s Johnson 1, sw sw sw 3-12n-15w, abnd 2012 ft.

Saginaw County — Failure: Maguire, Inc.'s Simmons 1, ne se nw 22-11n-1e, Dundee 3145 ft, abnd 3178 ft.

Mecosta County—Failure: W. C. Taggart's Consumers 2, c ne 14-15n-10w, Stray sand, abnd 1511 ft.

MONTANA WILDCATS

Pondera County—Failure: Hageman & Pond's Speer 1, ne se sw 17-28n-1w, Midway, wtr 1680-1695 ft Sunburst, abnd 1720 ft.

Yellowstone County—Failure: Carter's Gov't. 1, c sw sw 2-6n-32e, Custer wildcat, Cambrian 8450 ft, dry, abnd 8614 ft.

OKLAHOMA WILDCATS

Hughes County—Failure: Creekmore-Rooney's Fleet 1, ne ne se 10-8n-10e, Crom 3257 ft, abnd 3372 ft.

Kiowa County—Failure: L. A. Helms' Burnett 1, se ne sw 19-7n-20w, Gr wash 1120 ft, abnd 1137 ft.

Logan County — Failure: Texas Co.'s La-Grande 1, ne ne sw 25-15n-1w, 1st Wx 5730 ft, 2nd Wx 5835 ft, abnd 5864 ft.

Logan County — Failure: Sinclair Prairie's Harp 1, nw sw se 28-18n-2w, Wx 6108 ft, abnd 6146 ft.

Tillman County—Failure: Texas Co.'s Asenap 1, nw nw sw 25-4s-15w, Strawn 3655 ft, Arb 4150 ft, abnd 4196 ft.

Washita County—Failure: Pure's Redding 1, sw sw ne 8-8n-18w, abnd 6068 ft.

NEW MEXICO WILDCATS

Lea County—Failure: A. W. Cherry & Barron Kidd's Carder 1, c ne se 21-19s-33e, elev 3622 ft, anhydrite 1295 ft, salt 1500-2980 ft, md w 3595 ft, abnd 3600 ft.

San Juan County—Failure: Ada Williams et al's U. S. Government 1, nw nw ne 3-29n-11w, abnd 1000 ft.

WEST CENTRAL TEXAS WILDCATS

Shackelford County—Failure: Shell's Leachber 1, 330 ft snl and 995 ft wel sw¼ sec 36, Blind Asylum Lands, elev 1334 ft, abnd 4427 ft.

Taylor County—Failure: Geochemical Surveys, Inc.'s Click 1, 990 ft snl and 330 ft wel lab 22, Lge 146, Grimes CSL, elev 1880 ft, top Noodle Creek lime 2270 ft, abnd 2710 ft.

SOUTHWEST TEXAS WILDCATS

Duval County — Failure: Argo Oil Corp.'s M. D. Cohn's Est. 1, 11 mi n of Benavides, Le 7½ of Cohn S/D of Cantu Ranch, abnd 4705 ft.

Jim Hogg County—Failure: Sun Oil Company's A. C. Jones 7, Agua Nueva de Abaj Grt, 41 mi n of Rio Grande City, 9500 ft ne well No. 3, abnd 4693 ft.

LOWER TEXAS GULF COAST WILDCAT

Victoria County — Gas Discovery: Gulf Oil Corp.'s Mary Simmons 1, Anaqua area, Santiago Serna sur, perf 5350-58 ft, flow gas, some dist, shut in, td 6335 ft.

UPPER TEXAS GULF COAST WILDCATS

Jasper County—Failure: Humble Oil & Refining Company's Nona Mills Co. 1, BBB&C RR Sur 109, abnd 10,363 ft.

Matagorda County — New Gas Discovery: Skelly Oil Company's Granbury-Fullilove Unit 1, 3 mi ne of Van Vleck in Amos Rawlings sur, perf 8739-47 ft, flow 42 bbls 51-grav cond & 2,317,000 cu ft gas day, 3/16-in choke, td 10,010 ft.

SOUTH CENTRAL TEXAS WILDCAT

Fayette County—Failure: Kennecott Copper Corp.'s Hirsch N. Schwartz 1, ¾ mi n of cor Jno Castleman sur 3 mi sw of LaGrange, abnd 7036 ft.

EAST TEXAS WILDCATS

Leon County—Failure: H. J. Baker et al's Wells 1, 660 ft from m/s/sw and 1857 ft from se lines of 1271-ac tract, John Scritchfield sur, elev 440 ft, top Weches 280 ft, Queen City 360 ft, Reklaw 663 ft, Wilcox 859 ft, abnd in Wilcox 2886 ft.

Wood County—Oil Discovery: Bobby Mandel et al's Evans 1, 800 ft snl and 1800 ft wel of J. Stark sur, elev 440 ft, top Pecan 2970 ft, Gober 3845 ft, cut 2nd fault 4651 ft, Sub-Clarksville 4850 ft, Woodbine 5375 ft, Georgetown 5955 ft, pump 32 bbls 26.2-gr oil initial (pumps off in 10 hrs) from Sub-Clarksville, perf 4860-4905 and 4914-44 ft, td 6100 ft.

EAST TEXAS NEW PAY TEST

Anderson County—Long Lake Field Deep Failure: Tide Water-Seaboard's Evans 4, 1200 ft west and 500 feet south of east corner John Adams sur, elev 298 ft, Woodbine 6146 ft, Georgetown 6165 ft, Ft. Worth 6579 ft, Fredericksburg 7035 ft, Paluxy 7436 ft, Glen Rose 7888 ft, massive anhydrite 9245-9382 ft, Rodessa porosity 9570-9610 ft, James 9992 ft, Pettit 10,270 ft, Travis Peak 10,663 ft, abnd 10,686 ft.

NORTH TEXAS WILDCATS

Cooke County—Failure: James Stewart & Co., Inc.'s Felderhoff 1, 2083 ft ewl and 990 ft nsl of 364-ac lse, and sec 16, A. Stutzman sur A-1444, abnd in Schist 3059 ft.

Grayson County—Junked: A. L. Andree and F. Parsons' Whiting 1, 6000 ft snl and 4000 ft ewl of Daniel Dugan sur A-3, jkd 3042 ft.

Young County—Failures: John W. Harris et al's Rhodes 1, 330 ft out nwc of J. S. Fore sur A-1309, elev 1074 ft, top Mississippi 4460 ft, Ellenburger 4606 ft, abnd 4620 ft.

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■ FOR SALE: Load lugger in perfect condition complete with ten 1½ cu. yd. trays and mounted on 1939 Ford truck with new motor and 7:00/20 dual tires on rear. Will sell with or without truck. For information call or write Refinery Service Company, 3003 Navigation Blvd., Houston, Texas; Phone Fairfax 6358.

■ FOR SALE: One portable steam boiler, 150 HP, 300 lbs. pressure, and one Union Tool Duplex Steam Slush Pump, 12 x 7⅛ x 12 with OK Pistons and McClatchie valves. Will consider trade for 6 x 12 Power slush pump unit. The Ginter Company, P. O. Box 420 Lufkin, Texas.

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NOTICES

■ **Wanted Contracts, have gasoline drilling rig ready to go, might sell. Also have shallow production for sale. A. R. Lewis, Corsicana, Texas.**

HELP WANTED

■ Chemical Engineer to engage in research and development work with major oil company along crude oil producing lines. Would include some field work. Recent gradates of interest. Position offers good future. Give full personal data, experience, and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 30, c/o The Oil Weekly, Houston, Texas.

■ Research Geophysicist with several years experience preferably including field work and laboratory work, to engage in research geophysics with major oil company. In charge of work including evaluation of new ideas and experimental development of same. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 28, c/o The Oil Weekly, Houston, Texas.

■ Engineer or Physicist to engage in study of reservoir performance as related to physical properties with major oil company. Individual should have aptitude and background to enable the mastering of mathematical analysis of problems in flow of fluids. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 29, c/o The Oil Weekly, Houston, Texas.

■ Wanted by a consulting geophysical organization, Petroleum Engineers with Hayward Mudlogging experience or its equivalent. Immediate openings in Venezuela. Excellent opportunity for advancement to managerial positions throughout the world. Address: Box 36, c/o The Oil Weekly, Houston, Texas.

NOTICES

■ CAPITAL SEEKERS—Interested in raising $25,000 or more for a postwar project should write to AMSTER LEONARD, Fox Bldg., Detroit 1, Mich.

F. B. Paine Dr. Co.'s Criswell 1, 660 ft e and 3-0 ft n of nwc of J. A. Jowell sur, but in A. B. Tedbetter sur A-1689, Bend 3630 ft, abnd 3656 ft.

WESTERN CANADA WILDCATS

Taber: Mid-Continent Oil & Gas and Universal Petroleums No. 1, lsd 12 17-9-17w4th, completed 4724 ft, abnd; water in Madison Limestone and Devonian Dolomite; gas in Taber sand (Lower Cretaceous).

Crow Indian Lake: California-Standard's Crow Indian Lake-Province No. 2, lsd 1 20-4-14w4th, completed 2986 ft, abnd; dry hole; carried into top of Madison lime.

Legend: California-Standard's Legend-Province No. 3, lsd 13 23-7-13w4th, completed 3286 ft, abnd; dry hole; carried into top of Madison lime.

United States Wildcat Starts

CALIFORNIA

Kern County: Standard Oil Co.'s 81-21, ne ne 21-29-29, Kern Bluff area, lcn.

McDonald, Burns and Norris, Flickenger 2, ne ne 36-30-22, gas test in McKittrick area, lcn.

Bender Drilling Co.'s Vedder 14-2, nw nw 14-28-28, Round Mountain area, lcn.

Santa Barbara County: Hilo Oil Co.'s Gilmore-Dominion 1, sw sw 23-9-33, Cat Canyon area, lcn.

Ventura County: A. Oberholtz's Calumet C-10-1, nw nw 10-4-19, deep test Shiells Canyon area, lcn.

FLORIDA

Gulf County: Pure Oil Co.'s C. C. Hopkins 2, cent nw nw 21-6s-9e, lcn, moving in.

ILLINOIS

Fayette County: Paul Doran's Oldfield 1, ne ne nw 12-6n-1w, lcn.

Hamilton County: Sinclair Wyoming's Summitville B&T Co. 1, se nw sw 13-4s-6e, lcn.

Nat'l Assoc. Pet.'s McElvain 1, se ne se 9-5s-7e, drlg 347 ft.

Jefferson County: Nash Redwine's Johnson 1, ne ne sw 22-3s-3e, lcn.

Wabash County: M. E. Morton et al's Garner 1, ne ne nw 28-2s-14w, drlg.

Big Chief Drlg.'s Fiscus 1, nw nw sw 32-3n-13w, lcn.

White County: Great Lakes Carbon's Calvert 1, se sw ne 5-7s-1e, drlg 277 ft.

INDIANA

Dubois County: Texas Co.'s Weyer 1, se se nw 22-3s-4w, lcn.

Sullivan County: Texas Co.'s Mahan 1, ne se se 9-9n-8w, lcn.

Warrick County: Sunlight Coal's Hart 1, se se nw 27-5s-8w, drlg.

KANSAS

Barber County: Huber's Buck 2, ne sw ne 35-30s-14w, lcn.

Barton County: Phil-Han's Grossardt 1, nwc 6-16s-11w, lcn.

McPherson County: P. B. Allison's Stucky 1, swc ne 14-21s-2w, lcn.

Panhandle Eastern's Waltner 1, sec 36-21s-3w, lcn.

Stafford County: Keyes Drlg's Lafland 1, nw sw nw 28-22s-11w, lcn.

Pawnee County: J. M. Huber's Galliart 1, nec 31-22s-15w, lcn.

Pratt County: Paul Hatfield's Bryant 1, ne sw se 31-27s-15w, lcn.

Sumner County: R. L. Carnaham's Parker 1, nec se 7-30s-2e, lcn.

Woodson County: J. C. Jansen's Vaughn 1, sec sw 36-24s-14e, dr 820 ft.

KENTUCKY

Daviess County: Miller & Shiarella's Clayton Hrs 1, 19-O-27, drlg 288 ft.

Henderson County: Sun's Pinston 1, 19-O-22, lcn.

McLean County: Vickers & Slaghter's Durbin 2, 3-L-27, lcn.

NORTH LOUISIANA

Bossier Parish: J. R. Hayden's Ellerbe 1, sect 3-2n-13w, OWDD old TD 6022 ft, rigging up.

Madison Parish: Pres. Cochrane's J. M. Frazier 1, cent nw nw 22-17n-10e, lcn for Tuscaloosa test.

Sohio Petroleum Corp.'s H. Harper 1, 330 ft sl 2210 ft wl sect 2-16n-13e, bldg dk.

West Carroll Parish: California Company's Darnell 1, cent sw nw sect 6-19n-9e, lcn for 9000-ft test.

SOUTH LOUISIANA

Acadia Parish: Danciger Oil & Refining Co.'s Julius Frey 1, 5 mi s of Eunice, 4350 ft nw & 615 ft sw from se cor sect 40-7s-1w, lcn for 10,500-ft test.

MICHIGAN

Clinton County: McClanahan Oil Co.'s Aldrich 1, se se sw 3-7n-1w, rig.

Mecosta County: Smith Petroleum Co.'s Ream 1, sw ne se 29-14n-8w, lcn.

Montcalm County: Columbia Oil & Gas Co.'s Playmor 2, ne ne ne 13-10n-7w, dr.

Osceola County: Pure's Haist A-1, n½ se sw 25-17n-10w, lcn.

Roscommon County: Freeman Oil Co.'s State E-1, w½ nw nw 7-21n-3w, rig.

E. V. Hilliard's Wraco 1, nw ne nw 11-21n-4w, rig.

MISSISSIPPI

Leake County: Harold K. Boysen's Dinkman Lumber Co. 1, cent sw sw 8-11n-9e, lcn.

Washington County: O. W. Killam's Fisher 1, 330 ft n & e ls nw/4 7-17n-8w, lcn.

OKLAHOMA

Garvin County: Fox & Fox's Powell 1, nw ne 2-2n-2w, c&p.

Kay County: Mac Operating's Thain 1, nw sw se 27-28n-1e, rog.

Murray County: Prunty Prod. Co.'s McClure 1, ne se se 13-1n-2e, c&p.

Noble County: Watchorn O&G Co.'s Herschman 1, sw nw ne 25-21n-1e, lcn.

Pottawatomie County: Kerlyn Oil's Bourassa 1, nw ne se 21-6n-3e, rur.

TEXAS PANHANDLE

Collingsworth County: C. W. & W. L. Snoddy's R. Wischkaemper 1, nw nw sw H&GN Ry. 63, blk 16, mim.

WEST TEXAS

Bailey County: El Paso Natural Gas Co.'s West Texas Mortgage & Loan Co. 1, 650 ft ewl and 694 ft nsl sec 55, blk A, Melvin-Blum & Blum sur, on 72,651-ac lse, lcn.

Menard County: Phillips Pet. Co.'s Meta 1, 660 ft out sec of J. W. Bradford sur No. 501, lcn 3500-ft rotary test.

WEST TEXAS EXTENSION TEST

Gaines County—Seminole Outpost: Midway Oil Co.'s Morrow 1, c nw nw W. T. Ry. 200, blk G, 1½ mi ne of Seminole field, lcn 5500-ft test.

SOUTHWEST TEXAS

Jim Hogg County: Humble Oil & Ref. Co.'s Mestina O&G Co. B-5, Jose I. Salinas sur, 12 mi se of Hebbronville, 3500 ft e & 2500 ft s of sw cor Antonia Pena sur, lcn 10,000-ft test.

McMullen County: The Texas Co.'s Carrie Aguilare 1, 10 mi sw Tilden, 4290 ft fr n & 330 ft fr wl of sur, lcn 3000-ft test.

The Texas Co.'s W. S. Goff et al 1, Nicholas Salinas sur, 11 mi sw of Tilden, 3700 ft s & 1650 ft w fr ne cor 262.7-ac lse, Nicholas I. Salinas sur, lcn 3000-ft test.

Webb County: Texas Gulf Prod. Co.'s Bruni Est. B-1, J. V. Barrego sur, 7½ mi sw of Aguilares, 2500 ft fr w & 4200 ft fr most n'ly sl of 2000-ac lse, lcn 6000-ft test.

LOWER TEXAS GULF COAST

DeWitt County: Rowan & Hope & Ranger's J. C. Wallis 1, H. P. Cook sur, 4 mi s of Westhoff, 467 ft fr ne & nw ls of 102-ac lse, lcn 6500-ft test.

Refugio County: Hewitt & Dougherty's K. D. Roche 2, Thos. O'Connor sur, 467 ft fr wl & 1475 ft fr nl of blk 59, lcn 8000-ft test.

UPPER TEXAS GULF COAST

Harris County: Eltex, Limited's Westmoreland Farms 1, Blk 9, lot 31, Caleb McKenzie sur, 1½ mi w of Bellaire, lcn 7500-ft test.

Orange County: Arkansas Fuel Oil Co.'s Lutcher-Moore Lumber Co. 1, 3 mi ne of Orange, 1333 ft s & 2475 ft e of nec Lot 8, T. W. House S/D, B. Johnson sur, bldg road.

EAST TEXAS

Cherokee County: Crown Central Pet. Corp.'s Ophelia Stockton 1, 1775 ft nsl and 330 ft ewl of Steven Jarboe sur, 2 mi sw Mixon, lcn Woodbine test.

NORTH TEXAS

Archer County: S. D. Johnson et al's McGregor 1, 450 ft snl and 150 ft ewl of 80-ac lse, Sec. 7, Brazos CSL sur, lcn.

Chas. E. Morrison and Maguire Industries, Inc.'s McGregor, 150 ft out nec sec 7, Brazos CSL sur, lcn 900-ft rotary test.

Cooke County: S. D. Johnson et al's R. M. Zipperer 1, 330 ft out sec sect 24, Geo. Ivy sur A-516, dr 680 ft on 2000-ft contract.

Wichita County: Akin-Dimock et al's Ed. Foster 1, 950 ft snl and 1350 ft wel sec 1, SA&MG Ry. sur A-272, lcn 2100-ft test.

Young County: R. J. Watson et al's J. H. Choate 1, 150 ft snl and 250 ft wel sec 254, TE&L Co. sur, lcn 700-ft cable test.

WESTERN CANADA

Foremost: California-Standard's Foremost-Province No. 2, sw lsd 4 25-6-12w4th, co-ords, 330 n 330 e; rigging up.

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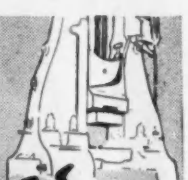

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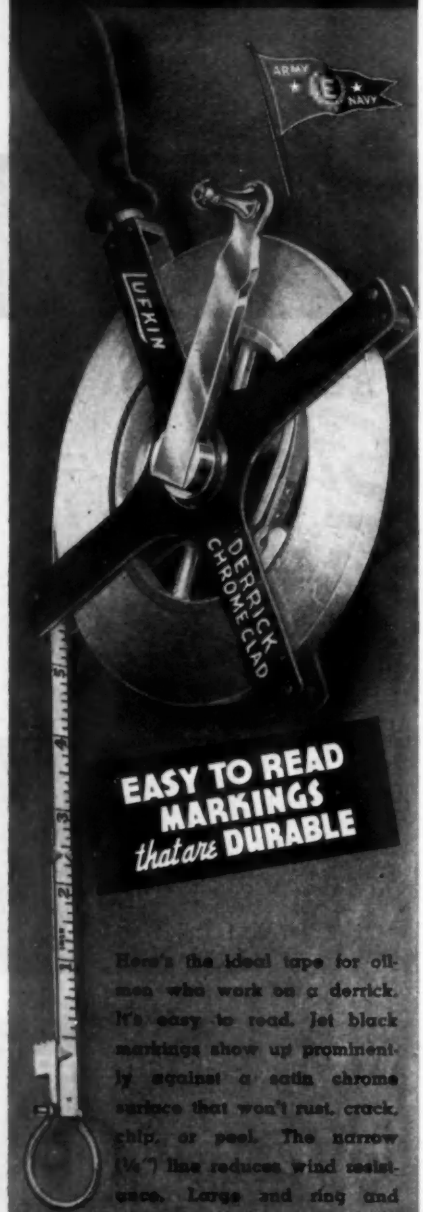

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Squeaks from the Bull Wheel

Poet's Nook

There'll never be a woman
In the White House I am told,
For a President must be at least
Thirty-five years old.

Cause for Tears

The hostess turned from the piano on which she had been butchering "Carry Me Back to Old Virginny" and observed that one of her guests was sobbing uncontrollably.

"There, there," she murmured comfortingly, "are you a Virginian?"

"No, madam," said he. "A musician."

Good Guess

The Department of Taxation received an income tax return from a bachelor who listed one dependent son. The examiner returned the blank with a penciled notation: "This must be a stenographic error."

Presently the blank came back with an added notation: "You're telling me!"

Both Wrong

"I thought I saw you taking a gentleman to your room last night, Miss Jones," said the stern landlady.

"Yeah. That's what I thought, too."

A Woman's Pledge

In time of war I'll never cheat,
Black market food won't cross my lips;
I'll eat less butter, sugar, meat,
For God, for country—and my hips.

But Naturally

After considerable search, a little boy and girl located a knot hole in the high board fence surrounding a nudist colony.

"Gee, look at the people," said the lad.

"Are they men or women?"

"Can't tell. They don't have any clothes on."

Pretty Puzzle

"I want an E string for my violin," said the GI in a London music store.

The girl clerk ducked behind the counter and came up with all the violin strings in the shop.

"Pick it hout yerself," said she. "I carn't tell the blinkin' 'e's from the she's."

There's a Difference

"They tell me your son is mechanically inclined."

"Well, he certainly has a knack of tinkering with a miss in a motor."

And Present Oars, Too

Smart-aleck recruit: "What do I do if I'm on sentry duty and see a battleship coming down the street?"

Captain: "Order the crew to advance in rowboats and be recognized."

Coarser the Finer

"I represent the Mountain Wool Company, Madam. Would you be interested in some coarse yarns?"

"Gosh, yes. Come right in and tell me a couple."

—The Pelican

"No, No, NO! It's not 'Stop or I'll scream.' It's halt or I'll shoot!"

Standco NO-SMOKE

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for the easiest brake known. It "feeds off" evenly. Standco never scores brake rims. See page 2808 Composite Catalog.

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823½ Monroe Street, Fort Worth, Texas

Notes for the Equipment Buyer and User

Flow Splitter

FISCHER & PORTER COMPANY

Fischer & Porter Company, Hatboro, Pennsylvania, has developed a flow splitter, the Micro-Rotaweir, to accurately divide a liquid flow. Proportions of the flow division may be varied by adjusting an outside lever and pointer to the percentage desired, as indicated by an external scale.

Operation of the device is as follows: The inlet pipe comes in from the top and discharges the liquid into a receiving chamber which has a rectangular weir as an overflow. A vertical knife edge is set against the external edge of the weir, thus dividing the stream into two parts as it flows over the lip of the weir. One stream flows into a closed compartment with bottom outlet, the other spills into the area surrounding the receiving chamber and discharges also from the bottom. The receiving chamber is connected through a stuffing box at the bottom to an external lever by means of which the weir may be rotated to any position with respect to the flow-dividing knife edge. A scale attached to the weir gives the liquid height above the weir lip so total flow to the Rotaweir may be obtained.

The outfit may be obtained with fittings in all metals. The shell may be either metal, or Pyrex glass. For high melting fluids, the metal shell may be lagged and steam-heating coils placed inside the Rotaweir.

San Antonio Office Opened By Wilson Supply Company

Wilson Supply Company, Houston, is opening an office January 1 at 1018 Alamo National Building, San Antonio, to be managed by R. C. Chenoweth, formerly district manager of Oilwell Supply Company's Shreveport, Louisiana, district.

Reference Charts Published By Lebanon Steel Foundry

Lebanon Steel Foundry, Lebanon, Pennsylvania, has published two reference charts, Cast Steels and Alloy Steel Castings.

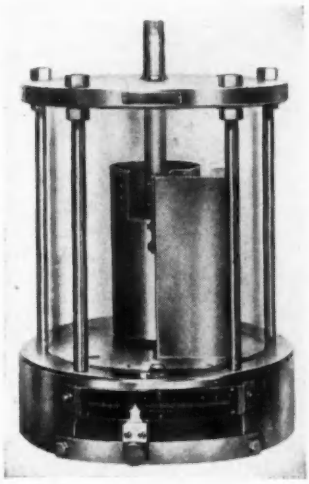
Cast Steels deals with carbon and low alloy structural cast steels, and includes comparable designations of U. S. Navy, Federal, ASTM, AISI, SAE and NE steels. Nominal analysis and minimum physical properties are given.

Alloy Steel Castings gives information on corrosion and heat resistant alloy steels and includes comparable designations of ACI, AISI, ASTM, Hydraulic Institute, SAE and U. S. Navy.

Penn Engineer Named

Penn Electric Switch Company, Goshen, Indiana, has appointed Donald G. Cameron chief engineer. He will be in charge of all engineering work on Penn's products.

Cameron has been associated with General Electric Company for 15 years.



Rotaweir Flow Splitter

Awarded Second Star

The Trackson Company, Milwaukee, Wisconsin, has been awarded a second white star to its Army-Navy E flag, for continued excellence in production of war equipment.

Crum-Brainard Purchased By Security Engineering Firm

Security Engineering Company, Whittier, California, has purchased Crum-Brainard Company, Ltd., also of Whittier.

The plants will be operated as separate units, with no changes in personnel. Crum-Brainard will retain its name, and its products will be sold and serviced by the purchasing company.

Export Representatives Named by Tulsa Concern

Tulsa Boiler & Machinery Company, Tulsa, announced appointment of Edward L. Carter and associate, Dermont T. O'Connor, as export representatives with offices at Room 1940, 30 Rockefeller Plaza, New York 20, New York. Carter is a graduate petroleum engineer with 17 years of domestic and foreign experience in engineering and operating phases of the petroleum industry. O'Connor is a veteran production superintendent with experience in many domestic and foreign fields.

Sales Officials Named

Joseph C. Broz has been made vice president in charge of sales and Charles E. Beck named sales manager for The

PATTERSON STEEL BUILDINGS Pay DIVIDENDS in SERVICE

For more than 24 years Patterson Steel Sectional Buildings have paid dividends in service. Through those years Patterson Buildings have been constantly improved by keeping in close touch with industrial requirements and creating special designs to fit specific needs. Patterson advantages start with steel—for easy erection, safety, endurance and high salvage value. Engineering knowledge based on broad experience, skilled workmen, modern plant facilities, coupled with steel, give you the finest buildings at the lowest overall cost.

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- **Steel Frames Carry Building Loads Separate from Sidewall Sections**
- **Flashed at Eaves, Ridge, Gables, Cornice, Windows and Foundation Lines**
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PATTERSON STEEL COMPANY

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Busch-Sulzer Brothers Diesel Engine Company, St. Louis.

Broz formerly was with Baldwin Locomotive Works, Philadelphia, and Baldwin De La Vergne Sales Corporation. Beck has been with Busch-Sulzer for 26 years.

Kerotest Names West Texas And Tulsa Representatives

Kerotest Manufacturing Company has appointed H. Glenn Dickenson as its Tulsa representative and Gene Best of Odessa, Texas, as the West Texas representative.

Dickenson has had about 15 years experience as a manufacturers representative in the Tulsa territory.

Best was formerly with Kerotest Manufacturing Company in its Odessa warehouse; and more recently has been marine machinery supervisor for Kaiser Company, Inc., at Vancouver, Washington.

Vice President Selected By General Electric Firm

General Electric Company, Schenectady, New York, announced election of Dr. C. G. Suits, assistant to the director of the research laboratory, to a vice presidency. He also will be in charge of the laboratory. Dr. W. D. Coolidge, who has been vice president and director of the laboratory since 1940, retires January 1.

Dr. Suits was graduated from the University of Wisconsin in 1927 and became a member of the General Electric laboratory staff in 1930.

Oil Well Improvements Firm Now Orbit Valve Company

Orbit Valve Company is the new name of the firm formerly known as The Oil Well Improvements Company, Tulsa, Oklahoma. It is announced that the management, products and policies will remain the same as in the past. The change is effective January 1.

Panorama of Lubrication Issued by Shell Company

Shell Oil Company, 50 West 50th Street, New York 20, New York, has published the eighth edition of Panorama of Lubrication.

The illustrated book outlines specific problems that aircraft engine improvements have posed for the oil industry in the belief that a thorough study of the causes and effects is the best basis for their solution.

"The Panorama of Aviation Lubrication" demonstrates how, as aircraft engineers strove for more power from less engine weight, the oil industry perfected new methods to maintain flight efficiency through lubrication.

Fire Brick Booklet

Armstrong Cork Company, Lancaster, Pennsylvania, has issued a booklet on insulating fire brick.

The booklet, which describes five types of fire brick for temperatures up to 2600° F., features new data on suspended arches and walls and tailor-made arches and domes. Photographs and sketches illustrate the text.

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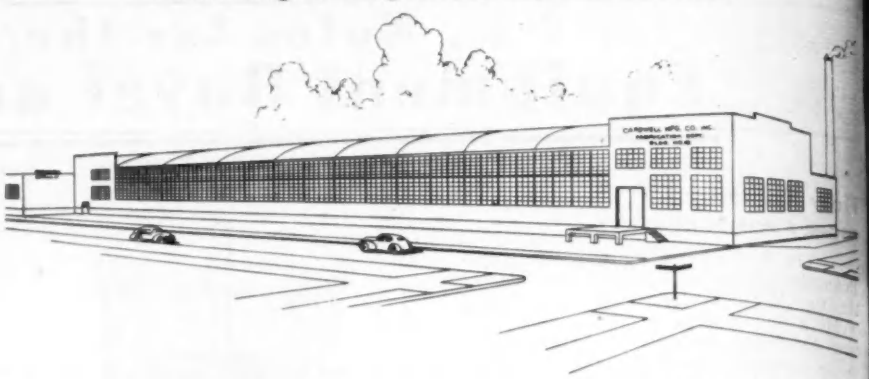
WALTER BURKE of Oil Center Tool Company has been transferred from Odessa, Texas, to Houston.

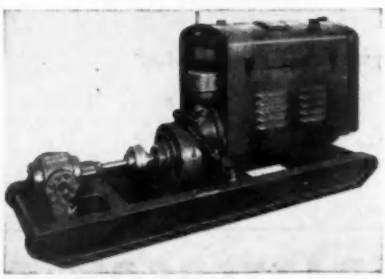
Fabricating Building Planned by Cardwell Firm



Plans of the Cardwell Manufacturing Company, Wichita, Kansas, for 1945 include completion of a new building (shown above), which will be used for fabricating masts, frames, etc., and will also include the sand blast and paint rooms. The building and steel yard will be equipped with a 70-foot span traveling crane. There will also be a 30-foot revolving crane in the steel yard for unloading material. Included in the plans is a 45 x 325-foot storage yard for frames and masts. Another traveling crane will be used in this area.

The building will be completed by July, 1945, and will be 325 feet long, 100 feet wide and 38 feet high. Construction will be of fireproof type.

In order to further facilitate the production of oil field drilling and servicing rigs, Cardwell has sold its pipe-line equipment division to Superior Equipment Company, Bucyrus, Ohio. Effective December 1, 1944, the Superior Company started manufacture of Cardwell sidebooms and backfillers.



Blackmer Pump

Oil Field Gathering Pump

BLACKMER PUMP COMPANY

Blackmer Pump Company, Grand Rapids 9, Michigan, has designed and built a pumping unit for use as a gathering pump in oil fields.

Specifications of the outfit are as follows: capacity, 50 gallons per minute; pressure to 500 pounds per square inch; mechanical efficiency at 500, 70 percent; suitable for suction pressures from zero to 100 pounds per square inch; will handle crude oils of viscosities from 40 to 200 Saybolt seconds universal; specific gravity, .82; power, 25 horsepower gasoline engine mounted on common fabricated steel skid with pump, reduction gearing and clutch.

The pump is equipped with special anti-friction bearings. Leakage is reduced to the minimum by the stuffing box which is designed to maintain a vacuum on the packing chamber.

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